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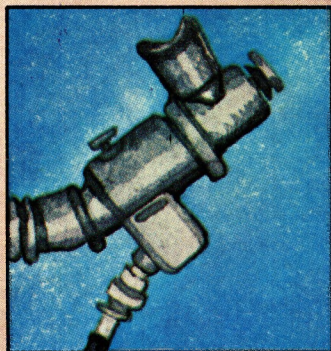
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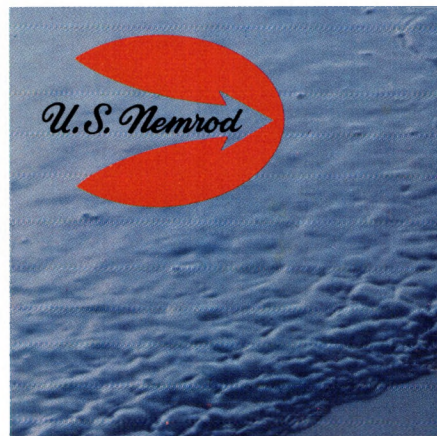



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A black and white photograph of a diver underwater, silhouetted against a bright light source. The diver is holding a camera with a large lens and is positioned diagonally across the frame. Bubbles are visible around the diver's head.

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MIGUEL GUZMAN-PEREDO

SPORT DIVER

SPRING 1979

DESTINATIONS



STEPHEN FRINK

The Bahamas Destination Guide 45

by James Duncan

Each year, the Bahamas attract more diving visitors than any other single destination. The diving is some of the world's best, and you can get there from here. Here's how.

The San Blas Islands 105

by Phil Trupp and Ned DeLoach

Pidertupo Village could be the Caribbean's most secluded, and least known, resort. The 360 islands of the San Blas Archipelago contain nothing more than a few thousand Cuna Indians. And acres of virgin diving.

Palm Beach County 145

by Tom Mount

The shoreline of Southeast Florida is almost one continuous dive site. The problem is not knowing where, but choosing which.

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Researchers are puzzled by the declining population of this common mollusk. Recent evidence suggests that the shell may be too beautiful to last.

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by Richard Ellis

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Their gear was primitive, but 19th century divers made up for it with outrageous audacity.

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One easy way to improve your photographs is to add people.

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How to turn a beautiful gastropod into a beautiful meal.

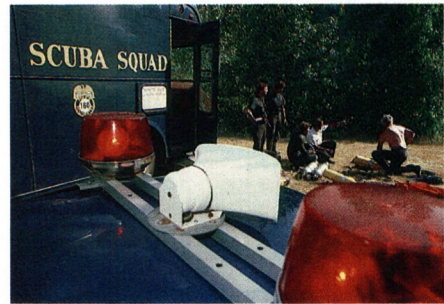
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by Dee Mosteller

Cover: Cooperative neighbors, the clownfish and anemone typify the many commensal relationships found in reef communities. Photo by Douglas Faulkner.

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Inside Sport Diver

The Complete Bahamas Resort Guide

The Bahama Islands are the world's favorite diving destination. No other area attracts the numbers of year-round visitors or has as many professional dive resort facilities.

Last year over 20,000 divers made the pilgrimage—an immense number. Yet spread over 700 islands and a year's time, there are still many places where solitude is almost an enforced virtue.

The problem is not to find a resort—there are land facilities and dive vessels serving all areas—but to locate one that gives you the types of diving you want and the right combination of relaxation and social possibilities.

Sport Diver can help you make that choice. In this issue we've chosen to initiate the most complete series of Diving Destination Guides ever published with a look at the Bahamas.

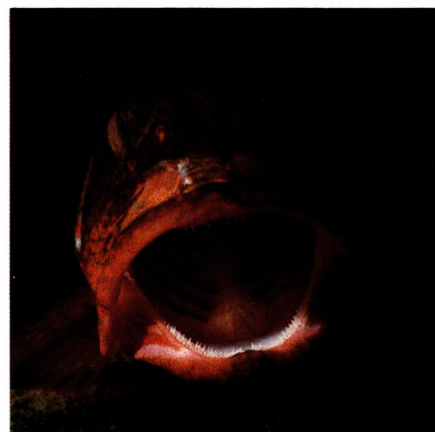
Now a regular feature in *Sport Diver*, the Destination Guides will cover the most exciting and well-developed dive areas of the world. In this section you'll find complete verbal and pictorial descriptions of the diving, and following each island or geographic grouping, a Specifications Page.

The page will show you the location, tell you how to get there, and what to expect both above water and below. And after you learn what is there, where it is and how to get there, you'll find specially-designed advertisements to tell you who services each area. These ads were designed by *Sport Diver* to give you the information you need. They're grouped alphabetically by island and operator behind the verbal/pictorial descriptions.

Covering a large area so thoroughly takes a tremendous effort. With the resources of our new owners, Ziff-Davis Publishing Company, we assembled a team of top-rank professionals: Diving writer James Duncan has been exploring the reefs of the Bahamas for a number of years. Special consultant Skeet LaChance first came to the islands in the late 1950's—and stayed. Researcher John Walsh has been intimately involved in Bahamas diving travel since 1976. Backing them up with photos are the best underwater talents available; both familiar pros and some new faces: David Doubilet, Rick Frehsee, Stephen Frink, Steven Lucas, Tom Mount, Bruce Nyden, Richard Stewart, Bob Wallace, Bob Warner, and Dave Woodward. And illustrator Don Warren's maps will help you pinpoint your favorite island.

These men bring to bear a combined level of knowledge and skill never before concentrated on one diving destination.

If you are unfamiliar with the Bahamas, you will learn what there is to know. If you know the Bahamas well, the vision of these men will show it to you in perhaps new and startling ways. Even though the Bahamas were the first known islands in the New World, their underwater frontier is still largely wilderness; a wilderness that is being discovered slowly, reef by reef. We hope our Guide can aid in your discovery.



DAVID DOUBILET

Steve Blount

Steve Blount, Editor



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The Mail

Who's Responsible

"Teaching Your Child to Dive" (Vol. 2, Fourth Quarter) by Julio Travieso should be mandatory reading for all scuba instructors. Mr. Travieso is correct when he says: "Diving, like most adult behavior, is largely influenced by our experiences as a youngster." But the attitudes of too many instructors makes it painfully clear that one has to think twice before enrolling a child in a scuba course. Students drop out of diving at an alarming rate. I believe that's because instructors fail on a lot of levels. We can do better.

Sandra B. Butler
Detroit, MI

Julio Travieso believes that parents, not scuba instructors, should show children how to handle themselves in the water. If parents really know what they're doing, that's fine. But as a diving parent I believe that only a professional instructor should be allowed to take a child underwater for the first time. Parents have a responsibility to teach many things, but when it comes to diving it's safer to stop at the water's edge.

Frank Mullens, Jr.
Racine, WI

Congratulations to Julio Travieso for a sensitive article on teaching children to dive. It's up to parents to instill confidence in their children. Too often a child wants to learn how to scuba dive but is turned off by an instructor whose poor attitude makes me want to question his right to teach. I was lucky. My instructor understood the needs and, yes, the fears of students.

Paul Weiner
Colton, CA

Help!

What gives? You print an article on the new NAUI Helpline, but fail to provide a telephone number. What is it? I have a problem.

Connie Rowe
Crestline, OH

You certainly do. The number is (714) 824-5440
—Ed.

Debate in Perspective

John R. Wenzel's article, "Shipwrecks and Treasure: The Legal Issue," puts the debate in clear perspective. It is too easy to scream at "Big Brother" and say that people who are seeking solutions to the treasure controversy get winked at by the Kremlin, as Jack Haskins seems to think. Your reply to Mr. Haskins said what a lot of divers wanted to say. There are conflicting issues and rights. The conflicts can

be resolved, but only if all sides are heard equally.

Mike Smith
Takoma Park, MD

Grant Proposal

Currently I am preparing a grant proposal that would allow me to present a very generalized view of man's environmental impact on the oceans to our area high school students.

One of the potential sources of funding for this project is NOAA. In Sport Divers' Vol. 2, Third Quarter issue, I read with disappointment your article featuring the problems in NOAA. Considering the fact that NOAA is just another cog in the bureaucratic wheel I felt your article was trustworthy and reliable.

Am I safe in assuming that the Sea Grant branch of NOAA is also experiencing troubles and if so is there someone within that agency that I should contact personally who might have a sympathetic ear towards my project?

Ross Meloan
Murray University
Murray, KY

NOAA is in trouble, Mr. Meloan, but ironically the Sea Grant Program is in good shape. An additional \$3 million was made available to it in fiscal year 1979. Your particular project sounds intriguing. Sea Grant is big on all forms of marine education and you don't have to be connected with a university to apply for grants. You may contact a Sea Grant director at your state university or discuss your ideas at the National Sea Grant office in Washington. Contact there is Dr. Warren Yasso, an education specialist. You may write to Dr. Yasso care of Office of Sea Grant, 3300 Whitehaven St., N. W., Washington, D.C. 20235. The phone is: (202) 634-4132. Best of luck with your endeavors.—Ed.

Dedicated U-352 Divers

Those who have done any type of wreck diving are familiar with the WWII German U-Boat off North Carolina.

Unfortunately, this nationally publicized wreck is in severe danger of destruction by a group of politicians and salvagers. In early 1978 Senator Weicker of Connecticut, who has been known to get his gills wet from time to time, found himself aboard a salvage vessel headed for the grave site of the U-352. The owner of the salvage vessel had expressed his concern to Senator Weicker about the safety of divers diving on the U-352 because of unexploded torpedoes on the U-352.

When Weicker surfaced from his dive into the past, he too thought of the unexploded torpedoes and how they might pre-

sent a danger to divers and fishermen alike. He immediately started a campaign to have the U-352 destroyed.

Now, divers, let's look at some facts. The owner of the charter boat that Weicker was aboard, has been quoted as saying he would have blown the propellers off the U-352 (made of high-grade marine brass) years ago if it hadn't been for those torpedoes. Those torpedoes have been there for 36 years without going off, and it stands to reason they will stay there for another 100 years without exploding. It is our speculation that this charter boat operator is using Weicker's influence and powers to fatten his pockets, or even, both of their pockets, at the expense of the U.S. Navy, who will undoubtedly do the blowing up of the U-352. The only one who will lose is you, the sport diver.

Certain dive boat captains have been told by a U.S. Navy diving vessel anchored over the U-352 not to approach the wreck and not to put divers in the water. They were told later by a Coast Guard official that the Navy was doing a survey—the prelude to having the U-352 destroyed.

Both parties can be satisfied by simply dismantling those torpedoes and have the State of North Carolina add the U-352 to their list of protected wrecks (like the Civil War blockade runners). That way, after the torpedoes which have protected the U-352 from salvagers are dismantled, the sub will still stay intact and serve as an artifact and a select dive spot.

When the U-352 was discovered, the German Embassy was contacted about the remains of 11 sailors who went down with the ship. Their reply was that they regarded the sub as an underwater tomb and that the remains of the sailors would not be removed. Our Government or salvagers have no right to destroy the graves of these 11 sailors.

I certainly hope that other divers will get actively involved, by appealing to their Congressmen and Senators before it is too late.

Wayne Moose, Jr.
Charlotte, NC

Creative Divers

It's about time Sport Diver considered the creative people in the diving population. We all aren't macho instructors and deep sea divers. I would hope we are in store for more material like the Richard Ellis portfolio.

Leigh Daniels
Charleston, SC

I have been reading your magazine since it first came out. I especially enjoyed your port-

continued

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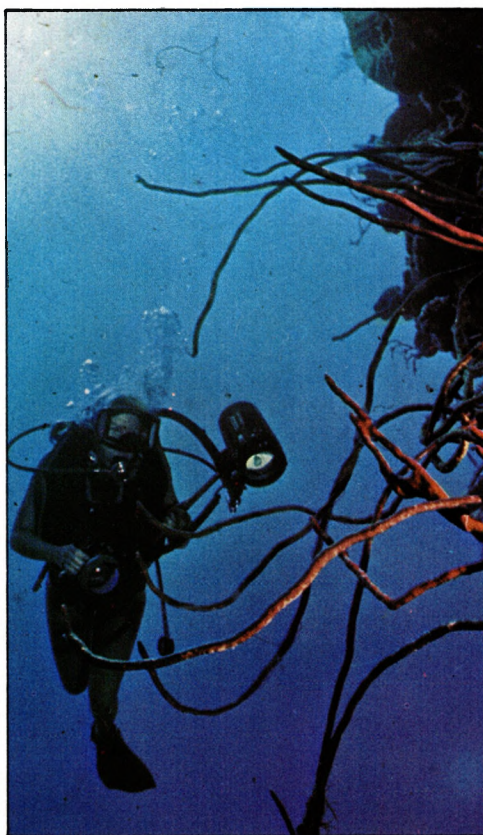
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THE MAIL *continued*

folios by Richard Ellis, and the drawings by Larry Foster (The Subject Is Whales) in the Vol. 2, Second Quarter issue. I'm a beginning diver, and am interested in obtaining reproductions of these works, either poster size, or magazine size. Is there any way to get these without cutting up my Sport Divers?

Mark Pidgeon
Pomona, NJ

Some Richard Ellis lithographs are available from: Sportsman's Edge, Ltd., 136 E. 74th St., New York, NY 10021—Ed.

"New Language" Not So New

I read your article "A New Language For Divers" (Vol. 2, Fourth Quarter) with mixed emotions, especially the statement "We're on the verge of an important communications breakthrough thanks to NAUI".

We made telephone calls to all of the local schools, but none of them offered a course in sign language. Several letters were sent to the state school for the deaf, to inquire about books and courses that were available. To my dismay, I never received a reply from them. It's possible that the school is not large enough to handle all of the deaf students they would like to, and therefore must turn some away. If this is the case, they surely would not enroll a student into a course just to learn sign language for a sport or hobby.

We then canvassed all the local book stores, but none of them had any books on the subject.

Our next attempt to locate information was in the public libraries. It took quite some time but we did finally locate two books. However, one turned out to be the history of the American Indian sign language, and the other was only a sign language alphabet used to spell out words. The books were quite old, with copyrights dated in the 1920s and 1930s. It seems there isn't much of a demand for this type of book, since the libraries have not obtained any new books in over 50 years.

So the idea of using sign language underwater isn't new, and it will not be a major breakthrough in diver communications. The only breakthrough if you wish to call it that, is when an organization such as NAUI offers a course in sign language for the sport diver. Perhaps even an AMESLAN Diver Certification will be offered along with the multitude of other certifications presently available.

But until that time comes, I guess I'll have to be content to just grunt into my regulator whenever my wife doesn't pose just the way I want her to.

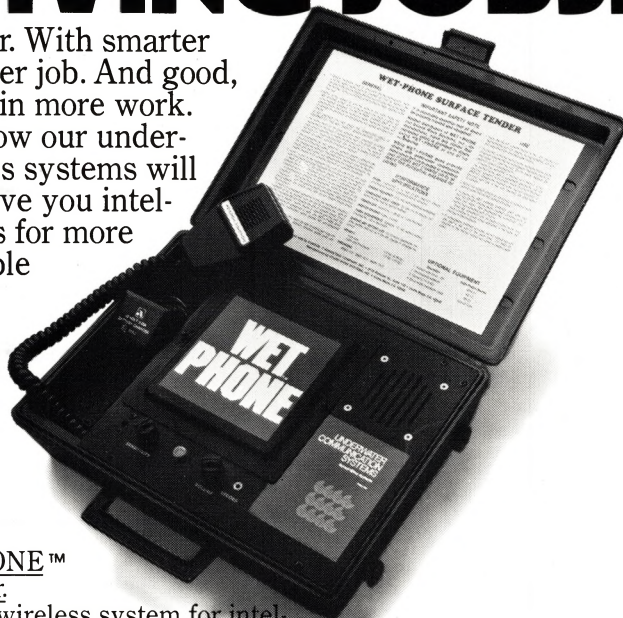
David G. Snedaker
Pt. Pleasant, NJ

Up to date books on AMESLAN may be obtained from the Gallaudet bookstore. For a listing of titles available write: Gallaudet College Bookstore, Seventh and Florida Avenues, N.E. Washington, D.C. 20002. Attn: Judy Mills. A course designed to teach AMESLAN to hearing divers would be an asset to the sport. Perhaps the associations and Bob Landers can find a way to include AMESLAN in the advanced open water curriculum, or will develop a specialty course. —Ed.

HOW TO TALK YOURSELF INTO MORE DIVING JOBS.

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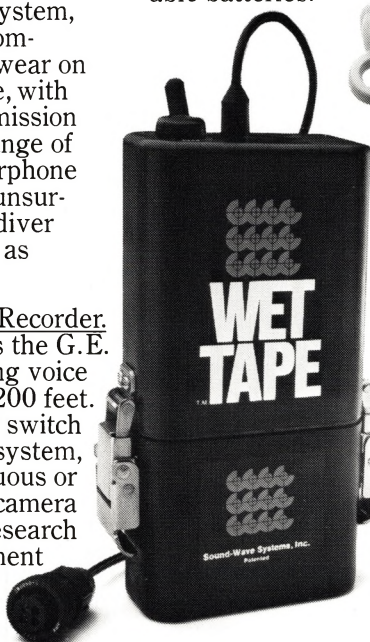
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A recording system that features the G.E. Micro II mini cassette, allowing voice recording down to a depth of 200 feet. Available with manual ON/OFF switch or a voice-activated ON/OFF system, WETTAPES gives you continuous or intermittent recording of camera settings, inspection notes, research findings, or moment to moment personal observations.



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Lowell Weicker

Undersea Exploration: A National Priority

Consider this: In its 202 years, the United States has always been a maritime nation. Its ships have plied the seas in search of the world's riches; its navies have been the strongest the world has known; fishermen constantly work its vast coastlines; industry extracts oil and gas from beneath its floor. Yet, only a handful of its population has ever been beneath the sea.

In the early days, daring explorers blazed the uncharted wilderness, followed by pioneering families that settled and turned this nation into an agricultural wonder. The experiences of millions of people set the stage and became the base for understanding how our land and atmosphere work.

The farmer touched the soil and knew it would grow his crops because he had experienced good soil in the past; the woodsman knew of the great abundance of trees and the many species because he could travel through the forests and see for himself what was needed to build his homes and ships.

Today, sophisticated technology is probing the natural environment, revealing information beyond that which was and still is the basic knowledge of human experience. I wonder though if this advanced learning about soil erosion or thunder clouds or even hurricanes could be possible without the overt observations and personal experiences of millions of people to build upon—I think probably not.

The oceans, said by some to be the last great frontier on earth, are little understood. Unlike the land, we are learning about the oceans by lowering numerous probes, nets, buckets and shovels into the sea. Even though these techniques have been employed diligently over the last century, the oceans still remain a mystery. This is understandable. A net full of fish, crabs, and seaweed dumped on the deck of research vessels in its chaotic, jumbled mass reveals something about species composition and population dynamics, but the puzzle is incomplete, for the most sophisticated scientific techniques cannot reconstruct the order by which the species lived in the depths. How could we expect to understand about birds, for example, which rely on trees or cliffs to nest, if we only saw these birds after they were captured and lying dead in a net? The oceans must be approached and studied from all angles, particularly by providing for more people to

enter the sea and bring back their experiences and first-hand observations.

The U.S. has only a few of its scientists and engineers now working beneath the sea. Several research submersibles, such as the *Alvin*, periodically ply the depths, but only four or less people are on board at one time. Only one habitat—Hydro-Lab—is working, in shallow water off St. Croix, Virgin Islands. Congressional efforts to initiate the Ocean-Lab program, which provided funds for development of a multi-function ocean going laboratory, continue but with a change in direction from a single, all-purpose auton-

*The oceans must be studied by
providing for more people to enter
the sea and bring
back first-hand observations.*

mous submersible to a series of small systems of habitats and submersibles.

All in all, there is very little happening. This is in direct contrast to the bright future that seemed to be looming in the early 1960s, when a flurry of activity to design and construct new submersibles and habitats began. Man had, for the first time, reached the deepest part of the oceans in the Marriannas Trench; he was learning to live on the bottom of the ocean for extended times. Man was truly on the verge of making great strides under the sea, promising to give marine research powerful new tools of study. By the end of the 1960s, however, interest in underwater exploration and research began to wane. Increased costs, nation-wide economic problems and poor planning most likely contributed to the diminishing interest. Large, expensive, one-time underwater programs were equally responsible.

Beyond these reasons and, in my opinion of far greater importance, is the lack of understanding at the federal level. After endless rhetoric about the great importance of the oceans to this nation, we have not done much to fashion an ocean policy that would set the guidelines for our research utilization and protection of the oceans. Even if a policy was written, I doubt that it would provide much for exploration and research.

I believe that we must turn the narrow thinking of our government and identify undersea exploration as a national priority. We have spent billions to search for life on Mars—unsuccessfully. At the same time, thou-

sands of life forms are estimated to exist in the sea that we haven't even discovered yet.

What can be done to assure that the eyes of man and his direct experiences beneath the sea are made part of a future national oceans policy? First, the public must be made aware of the importance of undersea exploration and research. The man in the street got behind the space program only because he was made part of its experience. Television programs and live broadcasts from the moon gave him a feeling of belonging. Existing ocean programs, on the other hand, are not in the public eye and are generally thought of as the private domain of the marine scientist or engineer. We must bring the oceans to the people, the ones who are paying the freight; they are entitled to participate. Undersea exploration, besides having sound scientific value, can be instrumental in human involvement in the oceans. No one will get very excited, for example, about an inanimate probe being lowered into the depths, but a person walking on the bottom collecting, touching, describing his observations and experiences is a different story.

Secondly, the people who will be directly working in the sea, the scientists, must get behind the effort. Constant bickering among scientists and government officials about the ills of OceanLab, for example, actually caused us to slip backward in the quest for advancing undersea efforts. It is far easier to achieve a working program that is acceptable to the majority by working together.

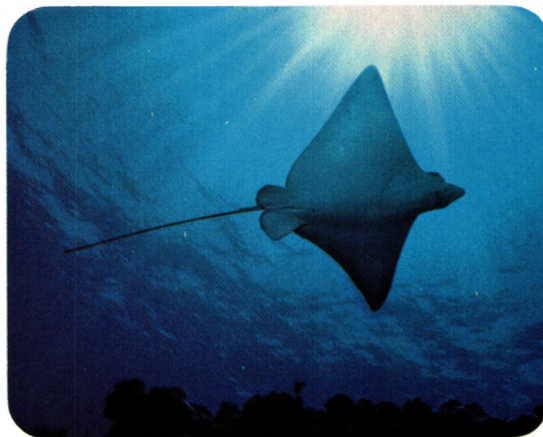
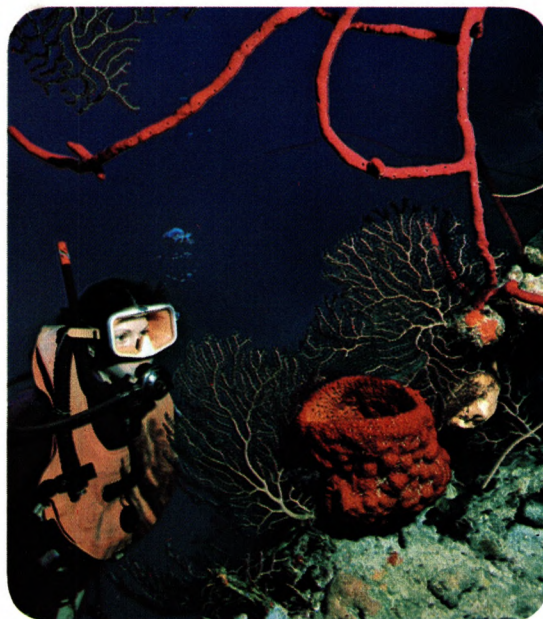
Thirdly, we must draw upon the experiences of sport divers. Sport divers are a vast storehouse of knowledge about the oceans. The millions of people who have spent even a few hours underwater have something to tell us. I believe that more of an exchange between sport divers and scientists could be enormously useful to our understanding and for increasing general public awareness. A national institute of diving may be the best way to accomplish such exchanges.

Fourthly, we must identify the conventional techniques (i.e. shipboard research) which will be enhanced by undersea exploration and research, and those areas of an overall ocean policy from which undersea exploration cannot be separated.

The oceans are our heritage; they will provide our sustenance in the future. The United States can ill afford to overlook any aspect of our approach to understanding the oceans. The presence of men and women in the sea is too important to forget, and our direct involvement under the sea must be made a national priority.

Senator Lowell Weicker (R. Conn.) is a concerned diver who has spent time in the Hydro-Lab. He is also a member of the Marine Resources Committee of the U.S. Senate.

World Wide Diving Adventures



Photos by Carl Roessler



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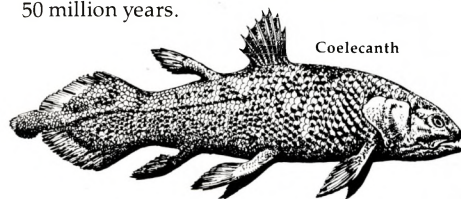
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Richard Ellis

Two-Thirds of the World

Our Society believes in science. With our faith in science and the scientific method, we have become complacent about the extent of our knowledge. Now that we are virtually on the brink of interplanetary exploration, it would appear there are no worlds left to conquer. We have come to believe we have almost all the answers, or that we can somehow obtain them, and outer space remains the last unexplored frontier. On our own watery planet, however, there are still unknown creatures, unanswered questions, unresolved problems. In our approach to the natural world, we need more humility and less arrogance. We need to realize that things we do not know about, and perhaps things difficult to imagine, do exist out there. "Out there" can mean not only outer space, but a hundred yards offshore.

In December 1938, a strange-looking fish was hauled in by fishermen off the Chalumna River, near the South African port of East London. It was dark blue, about five feet long, and its fins were on stalks, somewhat like the limbs of the higher vertebrates. It had large, heavy scales, and a curious lobe-like projection at the tail. Through a fortuitous sequence of events, this fish was examined by Marjorie Courtney-Latimer, Curator of the East London Museum, who subsequently brought it to the attention of J.L.B. Smith, a South African ichthyologist. Smith saw only the mounted specimen—Miss Courtney-Latimer had taken it to a taxidermist who had discarded the innards—but he reacted as if he had been shown a living dinosaur. Smith immediately recognized the fish as a coelacanth, a fish thought to have been extinct for 50 million years.



Smith named the fish *Latimeria chalumnae* after Miss Courtney-Latimer and the river near which it was found, and thence began a study that would become part of the zoological discovery of the century. He speculated the fish was an inhabitant of rocky ledges in moderately deep water, but finding another

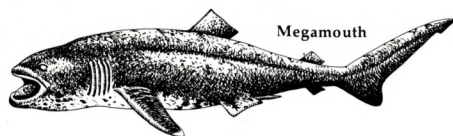
specimen proved to be extremely difficult. World War II interfered with Smith's efforts, and it was not until 1952 that a second coelacanth was found, this one off the Comoro Islands, between the East African mainland and Madagascar. A third specimen was caught in 1953, and to date, over 80 of these "living fossils" have been examined. The fossil record indicated these fishes have been around for over 300 million years, placing them among the oldest vertebrates still alive. But these are not only ancient fish. They are thought to be related to the primitive fishes that emerged from the ocean and from which came the first land vertebrates. These eventually produced the amphibians, reptiles, birds and mammals. This weird-looking fish, with the undershot jaw and extra tail, looks a lot like your own ancestors of the far distant past.

Even if this was the only instance of discovery of a previously unknown species, it would be significant because of the evolutionary ramifications. But the vast oceans hold many such secrets. Not only are some 100 new species of fish discovered every year; some of them are quite remarkable. Many of the new species are small, brought up from the depths in tight-mesh nets, but as we shall see, some are very large.

There are those who postulate the existence of the abominable snowman or of big-foot, huge anthropoid creatures said to live in inaccessible mountain areas and that are rarely seen. More important, of course, is neither of these fabulous animals have ever been captured, and therefore, distant and questionable sightings are our only source of information. There is no argument with the existence of the coelacanth, however, or some of the other spectacular inhabitants of the ocean's depths. The giant squid and other "sea monsters" have always represented the ultimate mysteries of the deep, and I propose to address myself here only to these imposing "monsters." The smaller curiosities are no less interesting, but they do not have the added advantage of enormous size to contribute to their mythology. We could also discuss *Carcharodon megalodon*, an extinct, 50-foot relative of the great white shark, whose six-inch teeth have been preserved and documented, but I would like to stick to those animals known to be alive in the oceans today, and save giant fossil sharks for another time.

The giant squid exists. Pieces of the tentacles and the body (called mantle) have been washed ashore or found in the stomachs of captured sperm whales. Much exaggera-

tion accompanies the folklore of the giant squid, but measurements of the pieces indicate a maximum length of 60 feet. A sperm whale in the Azores was captured with an almost intact 35-foot squid in its stomach; the squid weighed 405 pounds. It is interesting—and the subject of another essay—that while sperm whales can catch giant squid, we cannot. The only records we have of these extraordinary invertebrates come from animals stranded on shore or found in the stomachs of whales. In a definitive paper on the oceanic squids, Dr. Malcolm R. Clarke refers to "our complete inability to catch these active animals in the open ocean."



Paleontologists knew the coelacanth used to exist, and we know somewhere out there, perhaps at great depths, giant ten-armed invertebrates with dinner plate-sized eyes silently patrol the blackness. Scientists thought the coelacanth was extinct, and therefore the real surprise was discovering it had hung on for all these years without being discovered by science. It turns out that African fishermen had been hauling in the ugly things for years, but, finding them inedible, had always thrown them away. Since 1938, however, the existence of the coelacanth has been used to support every crackpot theory about sea serpents and monsters. It is a clear demonstration that we really do not know what's out there, and virtually anything is possible. It is almost impossible to demonstrate conclusively something does *not* exist; witness the ongoing controversy over the Loch Ness Monster.

But while the Loch is an enclosed body of fresh water, quite finite in size, the world's oceans represent an almost incomprehensible amount of water, almost 350 million cubic miles. Are there likely to be more large, undiscovered fish in the oceans? Of course there are. It is important to remember that only a very small portion of the ocean's surface is regularly travelled. The shipping lanes, representing the shortest or most expeditious routes between the world's ports, cover only a fraction of the total surface. Enormous areas, such as the southern oceans, are almost never seen by human eyes. And that is only the surface. Beneath the empty skies and rolling seas are billions upon billions of gallons of unknown water. There are whales that have never been seen alive, grotesque

Richard Ellis is a writer and illustrator whose world is natural history. His illustrations have appeared, among other places, in Reader's Digest, Audubon, Sport Diver and the new edition of the Encyclopaedia Britannica. Ellis is also author of the Book of Sharks.



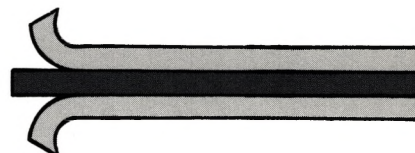
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INFLATABLES

For over 25 years Metzeler has been building the finest inflatable boats in the world. In Europe Metzeler is recognized as the industry leader. Now Metzeler high performance inflatables are available in the United States. Metzeler Inflatables are the world's best for a variety of reasons.

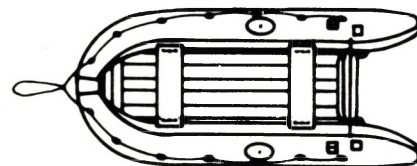
The Most Rugged Inflatable On The Market.

Metzeler uses a unique 3 layer Ripstop laminate with the middle layer being Trevira,[®] the space age material used in astronauts clothing because of its extreme toughness. This laminate is vulcanized at 302°F to give superior abrasion resistance. Metzeler's construction technique allows their inflatables to be inflated with the highest pressure in the industry thereby making them more rigid and less prone to structural weakness at seams and joints. Furthermore a unique blend of synthetic and natural rubbers are used on the finish coat to make Metzeler Inflatables impervious to corrosion from saltwater, gasoline and other common solvents.



The Highest Degree Of Safety In The World.

Metzeler inflatables are constructed to the most demanding safety specifications in the world. Most models employ 4 separate chambers and all models will operate in heavy seas even with one chamber deflated. In fact, Metzeler inflatables are virtually unsinkable. Their unique construction makes them tougher and more durable than most inflatables; punctures will not rip and are easy to repair. Even flooded boats will operate under full load, and their bright orange color makes Metzeler's cooler in sunlight and easier to see in emergency situations. All Metzeler boats are easy to get into from the water and will not tip even with two or more persons sitting on one side.



Superior Performance. No Matter How You Use Them.

Rowing, sailing, or under power, Metzeler Inflatables give the best performance available because of their high rigidity. In fact Metzeler holds most of the European Inflatable Speed Records. And they are the only high performance inflatables on the market that can be sailed.



Metzeler—The Most Versatile Inflatable.

Not only are Metzeler the only quality inflatable that will sail, they also provide 2/3 more passenger space than required by international standards. Their toughness makes them ideal in numerous situations: For divers, as white water rafts, as utility boats, or as sportboats. Entry to and from the water is easy, making Metzeler boats popular with skiers and divers.



The Easiest To Use Inflatable.

Because of their high inflation pressure they are the most rigid inflatable available and are therefore more efficient when rowing or sailing. Since no wooden floors are required, only air is needed to enjoy a Metzeler. Typical set-up time is 10 minutes. Metzeler's store quickly because of a minimum of parts. And they are more maintenance-free because of the toughness and durability.

General Purpose Inflatables

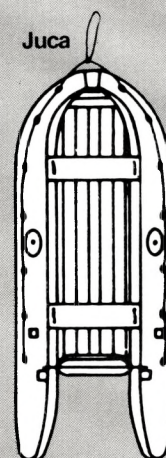
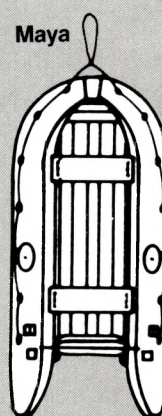
These models are ideal as utility boats, dinghies, or tenders. They are by far easier to row than any other inflatable of their size and they offer a sailing option. Only a small powerplant is needed to move them quickly through the water even when fully loaded.

Maya
 Assembly time: approx. 10 minutes
 Air chambers: 4
 Capacity: 3 adults, 1 child, motor (990 lbs. or 450 kg)
 Outside dimensions: Length 10'11" (332 cm)
 Beam: 4'7" (140 cm)
 Height: 1'7" (47 cm)
 Packing dimensions: 30" x 20" x 9"
 (75 x 50 x 23 cm)
 Weight of boat: 52 lbs. (23.8 kg)
 Motor power: up to 2.94 kW/4 hp
 Height of mast: 10'6" (320 cm)

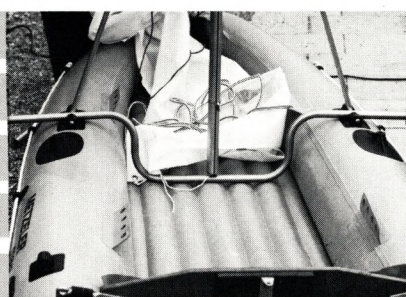
Standard Accessories
 Fittings for sailing gear and transom, rowlocks, two wooden thwarts, trailing and safety rope.

Juca
 Assembly time: approx. 12 minutes
 Air chambers: 4
 Capacity: 4 adults, motor (1100 lbs. or 500 kg)
 Outside dimensions: Length 12'10" (390 cm)
 Beam 4'9" (145 cm)
 Height 22" (55 cm)
 Packing dimensions: 33" x 20" x 10"
 (85 x 50 x 25 cm)
 Weight of boat: 64 lbs. (29 kg)
 Motor power: up to 4.41 kW/6 hp
 Height of mast: 18'8" (569 cm)

Standard Accessories
 Fittings for sailing gear and transom, rowlocks, two wooden thwarts, combined towing and safety line.



The Maya—With a capacity to transport 4 adults by rowing or under power, The Maya is an ideal dinghy. It has two wooden seats, safety rope, rowlocks and all fittings necessary for the sail option.



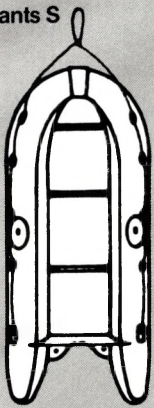
The Juca—Larger than the Maya, the Juca has a higher carrying capacity and accommodates a larger motor. Yet it is still easy to row and paddle. The sail option makes this a boat to enjoy in a variety of situations.



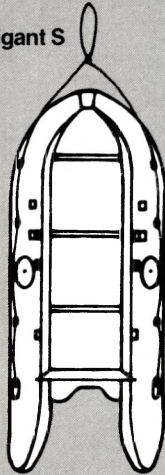
METZEL

Sportboat Inflatables

Markant S



Brigant S



Markant S

Assembly time: approx. 15 minutes
Air chambers: 3
Capacity: 3 adults, 1 child, motor (880 lbs. or 400 kg)
Outside dimensions: Length 10'8" (326 cm)
Beam 4'11" (149 cm)
Height 24" (62 cm)
Packing dimensions: 35" x 33" x 11" (90 x 83 x 28 cm)
Weight of boat: 104 lbs. (47.1 kg)
Motor power: up to 8.83 kW/12 hp
Height of mast: 15'6" (473 cm)

Standard Accessories

Wooden floor, keel tube, sail fittings, row-locks, handles, combined towing and safety line, transom plate, tank straps, bilge valves.

Brigant S

Assembly time: 20 minutes
Air chambers: 3
Capacity: 4 persons, motor (990 lbs. or 450 kg)
Outside dimensions: Length 12'8" (385 cm)
Beam 5' (152 cm)
Height 25" (64 cm)
Packing dimensions: 37" x 33" x 13" (95 x 83 x 33 cm)
Weight of boat: 119 lbs. (54.3 kg)
Motor power: up to 18.4 kW/25 hp
Height of mast: 17" (517.5 cm)

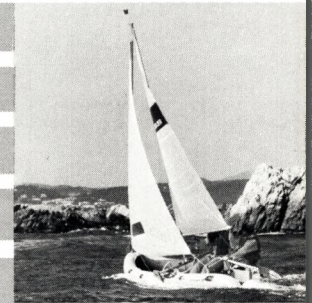
Standard Accessories

Wooden floor, keel tube, bilge valves, fittings for sailing gear and remote steering, row-locks, holding handles, trailing and safety rope, tank straps, transom plate.

The Sportboat Inflatables are designed to give higher performance than the general purpose inflatables and therefore will accommodate higher horsepower. Both "S" models are quite responsive under sail and the Brigant S is capable of pulling a slalom skier with 3 persons on board. Even with these high performance capabilities assembly time is minimal: 20 minutes at most.

Markant S—This model is an excellent sailer and accommodates 3 adults and a child. With a 12hp motor, the Markant zips effortlessly thru the water. Like all Metzeler Inflatables, Markant S gives all the benefits of boating; without the hassle of maintenance, storage, or transportation.

Brigant S—Performance plus. It's lightweight (a mere 112 lbs.) means it only needs 25hp to pull a slalom skier and carry 3 adults. Under sail it's performance is breathtaking. Standard features include wooden floors, keel tube, fittings for the sail, remote steering options, and much more.



For complete information on these and other Metzeler boats, contact:
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ER

Elefant—The Ultimate Inflatable

(Pronounced L-Fant)

With a capacity to carry 1325 lbs., and able to handle up to 55 hp, the Elefant can take you anywhere, anytime, in complete confidence. Sportboat, utility craft, or transportation, Elefant does it all. Take your friends out for an afternoon of skiing—it will pull two slalom skiers with 3 adults on board. Or use it for offshore skin diving expeditions—it has the carrying capacity and ruggedness you need. All with the convenience and trouble-free use Metzeler Inflatables offer.

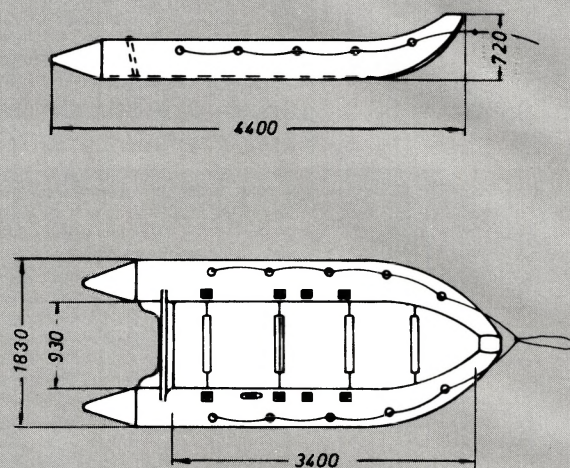
Elefant

Assembly time: approx. 30 minutes
Air chambers: 3
Capacity: 5 persons, motor (1325 lbs. or 600 kg)
Outside dimensions: Length 14'5" (440 cm)
Width 6' (183 cm)
Height 2'4" (72 cm)
Packing dimensions: 3'9" x 2'10" x 1'8" (115 x 85 x 50 cm)
Weight of boat: 193 lbs. (87.6 kg)
Motor power: up to 40.48 kW/55 hp

Standard Accessories

Wooden floor, keel tube, keel profile, bilge valves, holding handles, trailing and safety rope, tank straps, transom plate, fittings for remote steering

Elefant



(mm)



Metzeler

Inflatable

Guide

Model

Length

Max. Power

Load Capacity

Maya

10' 11"

4 hp

990 lbs.

Juca

12' 10"

6 hp

1100 lbs.

Markants S

10' 8"

12 hp

880 lbs.

Brigant S

12' 8"

25 hp

990 lbs.

Elefant

14' 5"

55 hp

1325 lbs.

fish that glow in the dark, unknown vertebrates and unsuspected invertebrates. Northeast of the Hawaiian island of Oahu, in November, 1976, they found one of these—Megamouth.

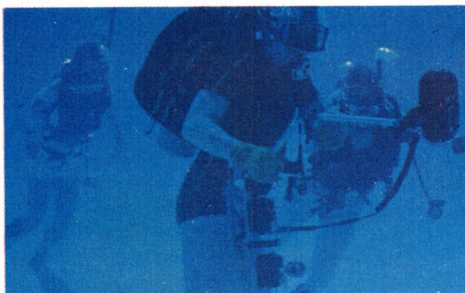
Fifteen feet long, 1600 pounds, with huge rubbery lips and hundreds of tiny teeth, Megamouth is a type of shark that no one had ever seen before, and whose existence was totally unsuspected. Off Kaneohe, a Navy research vessel was hauling in a parachute sea-anchor. Along with the orange and white chute, there came aboard a large, grayish shark. It had apparently tried to eat the chute at a depth of 500 feet, and had suffocated. Most of the Navy personnel wanted to dump the offending fish overboard, but a young lieutenant, Linda Hubbell, realized that the shark was unusual. It was taken to Dr. Leighton R. Taylor, the Director of the Waikiki Aquarium, and an acknowledged expert on sharks. He immediately realized it was unique and remarkable; it belonged to no known family or genus, and unlike the coelacanth, it had no fossil affinities. An examination of stomach contents showed it to be a plankton eater (like the whale shark and the basking shark), and it was suspected that the protrusible mouth might have been bioluminescent.

In an age when we photograph Mars or the parasites of a flea, it is fascinating that the ocean can still conceal such mysteries.

This shark, which has yet to receive its official scientific name and is still known as Megamouth, could have remained undiscovered forever. As a deep-water plankton feeder, it would have no reason to rise to the surface. It would never have taken a fisherman's baited hook; the organisms on which it normally feeds are euphausiids, less than an inch long. Moreover, sharks lack a swim-bladder, and without this buoyancy, they sink when they die, and therefore the body would not wash ashore. The single specimen of this new family was a mature male, and everything we know about the animal comes from meticulous examination of this individual. Navy scientists have returned to the same offshore location and set the same parachute at the same depth, but this time they accompanied the rig with an underwater camera system. So far, no other Megamouths have been seen.

In an age when we can photograph the surface of the planet Mars, or micro-photograph the parasites on a flea, it is a fascinating realization that the dominant element on our own planet—the two-thirds of the Earth's surface that is under water—can still conceal such mysteries. But the sea will give up its secrets slowly, and it is safe to assume there will continue to be surprises.

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What you would see with an ordinary face mask.



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SD31

Dick Anderson

A Vicious Moray Eel Attack

Initially I had some reservations about publicizing this totally unprovoked moray eel attack but hopefully diving has popularity enough that one short story won't ruin it. I mean, after *Jaws* the Diving Equipment Manufacturers Association can only regard this as a minor transgression.

Moray eels look a lot meaner than they are. Thankfully. If they were as mean as they looked, sport diving would have stopped about nine days after it started and U.S. Divers Company would still be called Rene Sports.

After an inexhaustive research into the moray eel, and interviews with persons who have been sharing the ocean with them, I have finally figured out just what it is about a moray that's so scary—it's *not* because they have a faintly discernible history of biting divers.

Some of the general fear of morays is caused by their snake-like configuration. Part of this serpentine fear may be due to inherent human instinct, but it mainly comes from mothers who yell "Watch out for snakes!" every time the kids go for a romp in the park. More kids die from bee stings than from snake bites, but it's not often that you hear a mother yell "Watch out for bees" when the kids go park romping. The difference is that bees are sort of cute, and they make honey. Snakes look slinky and sinister—obvious villains. With one notable Biblical exception most women are just plain terrified of anything that resembles a snake. They feel obligated to perpetuate the fear.

Now, before I get any further into this, I should probably clarify my use of words like *fear* and *scary*. In the case of the moray eel I'm not talking about a general and pervasive fear. Few divers would admit to that even if they had it. Including me. Anyone who has talked to divers knows that they scrupulously avoid the use of words like *scary*, *afraid*, *fear*, *fright* and *terror*. If pressured to relate a particularly hair-raising close call, the best you get out of them is something like, "I was suddenly overwhelmed by a profound feeling of apprehension." Scared? Never!

No, what I'm talking about is that initial start you get when you glance over and see the steely blue eyes of a moray three feet from your faceplate. The effect is momentarily startling to even the coolest diver. Well, it isn't the moray eel that's startling, it's the fact that he's looking at you. It's the fact that you suddenly realize he's been watching you for

five minutes and you didn't see him.

According to one old story, if a moray eel bites you, you're supposed to just hold still, and after an indeterminate period of time the moray decides that you don't taste good and spits you out in disgust. In case he takes a long time making up his mind you should have a copy of *Reader's Digest* or *Sports Illustrated* along with you. I really don't think the guy who started this baloney ever tried it himself.

I've only seen a couple of guys get nabbed by morays and they completely ignored the above rule. My old pal Jack Huber and I were diving for lobsters in the Keys a few years ago, and a medium-sized moray chomped down on Jack's thumb as he reached into a hole. Now, Jack was a cool enough diver, but did he wait around for the moray to decide if it liked the flavor of his thumb? He did not! Normal human reflexes don't allow for such a leisurely reaction to pain. It was one quick yank and a slightly shredded thumb. On the surface I explained to Jack that he should have waited for a few minutes, and he responded by brandishing another of his digits at me. How can you teach anything to a guy like that?

I've got another good friend named Al Hanson who spent 30 years underwater as an active commercial diver. He has had countless run-ins with moray eels. In fact, it was Al Hanson who showed me how a free-swimming moray eel gets leverage to rip a chunk of meat out of whatever it happens to be chewing on. First it sinks its teeth into the meat. Next, it throws an overhand knot into its tail, runs the knot down its body until the knot is pushing against the meat, and then it pulls its head, bite included, out through the center of the knot. Once you have witnessed this procedure you will probably not want to lounge around in hopeful patience while a moray decides what to do after he bites you.

Al Hanson is a bit of a showman, and he used to entertain his visiting diver friends by reaching right into a moray's hole to pull the brute out barehanded. Talk about impressive! This is one of the most impressive things I've ever seen in diving, but I can't find many guys who like to do it.

At first Al Hanson used to say that morays never bite. Then he modified that somewhat to say that they hardly ever bite. Then he acknowledged that once in a while they bite. Then, while displaying his numerous scars, he began to admit that they bite quite a lot. Then he quit doing it.

Well, now that I've offered enough background information on the moray eel to present him in enlightened understanding

I'll tell about the one that attacked me.


The attack took place in 70 feet of clear, warm water near Honolulu. I was in Hawaii on a diving job with another old friend, author E.R. Cross. We had installed a length of very heavy-duty 16-inch oil discharge hose, and on the final day I dropped down to check one of the connections.

Cross had cautioned me earlier to watch out for morays and sharks. Sharks I always watch out for, but California divers, like me, have a tendency to be a bit disdainful of morays. California moray eels are generally very polite and adhere to a strict moral code. Not so with Hawaiian and other tropical morays. They tend to be a bit more aggressive. In fact, it's not too uncommon to see them swimming around openly looking for a small diver.

Anyway, I was checking out this big flange, thinking of nothing but money and sharks, when I felt something strike my hand. In that same instant I saw the attacking moray and recoiled in that spontaneous revulsion, the instantaneous flash of fear, that is characteristic of a serpentine attack. My hand ripped free, and the moray glared at me with unbelievable defiance.

It was somehow impossible for me to surface with the job half done and try to explain to Cross that I was scared off by a solitary moray eel. No, I had to finish the job in spite of the objections of the vicious eel. After regaining my composure, I went after him with my 24-inch crescent wrench to show him who was boss and to reestablish my manly natural dominance of the situation.

The moray wasn't ready to do battle on my terms. He retreated into his hole behind a row of big bolts and glared at me as I banged on his haven a few times as a warning. He stayed in his hole, and I went back to work. I was just finishing my inspection when, suddenly, the eel attacked again! He grabbed the same spot on the same hand in a vicious bite, and I felt his needle sharp fangs penetrate my leather glove.

Again I instantly recoiled, but this time I wasn't so lucky. The savage eel's teeth were sunk firmly into my diving glove, and as I jerked my hand back his teeth didn't tear loose—I pulled him out of his hole. The violently flailing moray eel was trying to eat me right on the spot, but being a generally calm and collected diver I simply took off my glove and shook it til the moray let go. He swam back into his hole, and I swam back to the surface with great appreciation of the fact that the eel was only 11 inches long. 

*Dick Anderson is a freelance wit whose absurdities were last viewed by divers in *Aquarius Magazine*.*

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Dee Mosteller

Microview

The other day I had to sit through one of those no-one-wins semantical arguments over the meaning of the terms "macro" and "micro" as they apply to photography. One party insisted that macro-photography is the correct term for the imaging of small things. The other claimed that macro means large; micro small; and therefore the proper term has to be micro-photography.

I was finally driven to the Webster's. The curious thing, to me, was that for years I have been taking closeups of little things with my fine macro lens without ever questioning the accuracy of the namer.

According to the Second Concise Edition of the *New World Dictionary*, "macro," from the Greek *makros*, is "a combining form meaning long, large, enlarged, or elongated..." "Micro," from *mikros*, means "1. little; small; minute... 2. enlarging or amplifying... 3. microscopic... 4. one millionth part of (a specified unit)..."

In other words, the microcosm is the miniturization of the macrocosm; and the macrocosm is the enlargement of the microcosm. Or something. Both parties are right.

The discussion brought to mind the fact that it really is the small things in life, and in diving, that make it all worthwhile.

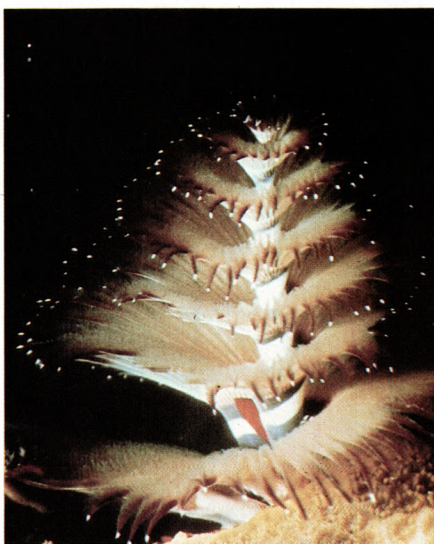
Diving can be, and usually is, a big hassle. Heresy, you say? If you ever stopped to tote up the hours of preparation, and compute the pain of squeezing into a skin-on-skin wetsuit or climbing down a rocky embankment with 60 pounds of equipment dragging you over backward like a tipsy turtle—all for a 45 minute dive—you might be tempted to pack it all in.

So, what makes the pain and sweat bearable, even wonderful? The annual trip to Andros? The once-in-a-lifetime meeting with a giant squid?

To some extent. But those are rarities in sport diving. It's that chance glimpse of a shy cornetfish before it disappears in a flash of silver and blue. The smile of a surgeonfish. The brilliant splash of color on a nudibranch. The little piece of copper plating discovered near a wrecked schooner. These are the tiny things that make diving memorable.

And it's the small peeves with other divers that make me the maddest. A friend claims he will, when pressed, "dive in cold water, but not in cold and murky water. In fact," he adds self-righteously, "I won't dive in any murky water."

Dee Mosteller is a traveling writer with a passion for diving. This is her first contribution to Sport Diver Magazine.



FRED BAVENDAM



DAVE WOODWARD

"What's murky to you, Gobbler?" I ask, color rising to the challenge.

Murky, as suspected, turns out to be anything with less than 50 feet of visibility. And since he lives in the Northeast, his diving is obviously limited to the four clear days allotted to New England each summer and package tours to the islands. It also means that he's forgotten the essence of sport diving.

The essence is the things that happen on every dive: Encountering a moray, fairy basslet or batfish; watching the clownish performance of a Louisiana crawdad; touching a sponge; following an old catfish as he snuffles along the bottom of a silty lake.

There are other, very common, sensations—small in scope, large in effect—that can send shivers up the backbone and cling to the outer rims of memory: The warmth

that floods your body as you ascend through those mysterious lines of temperature change; stepping into the water after waiting on a hot beach or boat; the play of sunlight on the bottom of a Missouri stream; the joy of weightlessness; having a non-diver say, "You're a scuba diver? Wow..."

My friend, unfortunately, isn't alone. A lot of divers tend to measure the success of a dive by the amount of visibility present. I've even heard some say they won't dive unless they have 100 feet. Resorts perpetrate the myth of visibility-means-quality by advertising the *unlimited* visibility of their waters. Why, you could see all the way to Portugal if the world were only flat. Pity.

But who wants to see to Portugal when you're looking for a lobster in a tiny crevice? A hundred feet is gross excess when you're searching for a lost light meter or a basket sponge. You only need to see as far as your arm can reach; anything else is out of touch, out of mind.

I must admit that seeing a great, gray whale loom up out of the deep blueness off California, or a loveable old one-ton manatee sail toward you in Florida's Crystal River, are the experiences of a lifetime. But there are microcosmic versions of these encounters that are equally exciting: Seeing the rainbow array of algae on a crusty rock; having a porcupine fish inflate itself against the background of an inky night sea; magnifying a living, breathing coral polyp; having a thousand tiny starfish, dazzling in their contrasting whiteness, loom up on the brown floor of Long Island Sound.

Once a trunkfish allowed me to hold it, unrestrained, in my bare hand while it nibbled softly at my fingers, seeking its own microcosms. Its great round eyes stared in complete trust as I ran the tip of a finger down its smooth side. Now that is the stuff that fogs the facemask; and you don't need a million miles of visibility to experience it.

It is really this string of minutiae, and the focusing of our attention—intentionally or by force of the day's visibility—on those micro-beings and events that are best seen or felt from a short distance, that make up the largest measure of the joy that is unique to sport diving. It is the enlarging, or macroing, of these micro things into that which is large, important—in your lens, in your mind.

So the next time you stand on the edge of a murky-looking lake or sea, don't bemoan the limits imposed by the visibility. Instead, think of the wonderful little things that you are about to see and feel there. Think small. It is, indeed, quite beautiful.

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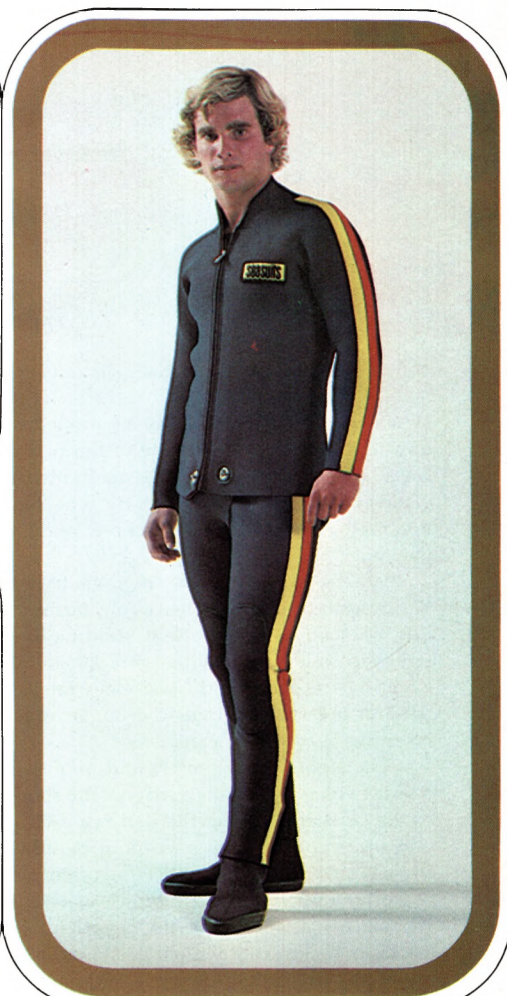
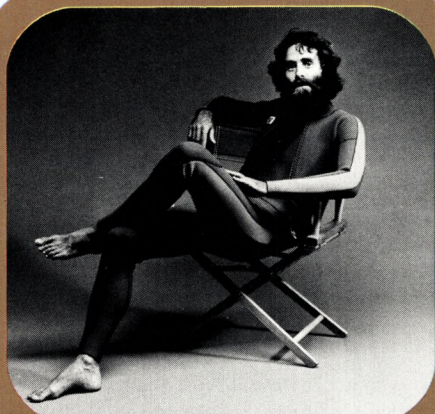
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Letter From

...the Red Sea.

BY DIANNE DUBLER

When the Sinai Peninsula is mentioned today, few recall it as the home of the world's finest safari. Divers who have made the pilgrimage will never forget, those who have not may have only two or three years to plan one.

Israel's decision to give the Sinai back to Egypt has not affected the diving business. Life goes on as usual. New building construction continues. Diving tours come daily from all parts of the world, especially Europe. Airfares to Israel continue to drop, an added incentive to the American diver.

The eight diving centers and numerous holiday villages and hotels that dot the shores of the Gulf of Eilat and the Red Sea did not pop up over night. After years of building, these pioneers of the Sinai have all intentions of working up until the day they leave. Some speculate that, once gone, the Egyptians will ask them back to fill their old positions, since Egypt has had little experience in the diving business. Whatever the outcome, many Israelis here accept the political bequest in hopes that peace will follow.

But the daily business of outfitting and escorting diving safaris continues.

At Neviot, a 19-passenger Mercedes bus is packed with diving and camping gear and provisions for five days for eight divers, one bus driver and a dog. With passengers aboard, it pulls away towards the southern route that borders the Red Sea.

The physical beauty of this peninsula's coast begins to sink in after the first day. Like a black ribbon, the road winds down the coast, with Saudi Arabia and the sea to the east, and the Sinai Desert to the west.

Here, the old and the new are engaged in a continuous ping-pong game. While scuba cylinders are being filled by a portable air-compressor, a camel meanders by in the background and several of the desert beasts stand motionless nearby like granite monuments. These space and time jolts continue on into the water. There seems to be one moment during each dive when I feel grounded. That comes when I have turned my back on the arid mountains and approach the water.

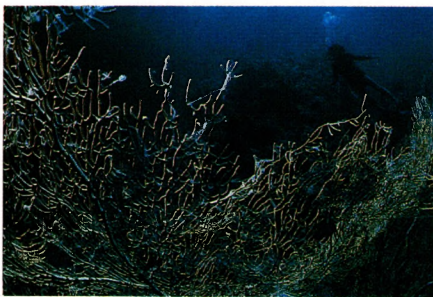
Some evenings are spent in sleeping bags under the stars and others in palm-thatched huts, built on Bedouin-owned land. These indigenous people of the Sinai number about 10,000. One evening is spent listening to a Bedouin tell stories about the ecology of the

Sinai—about the animals, like the lion and ostrich, that are extinct. He is happy another safari has stopped to camp. The Bedouin and Israelis co-exist like desert and sea.

Moving south the diving gets better, but each location is remembered for its own specialty. Neviot boasts exceptionally large sea horses and a giant stone fish. Dahab has some of the tamest fish to be found. Ras Um Cid displays a huge variety of corals, fish and giant sea fans. Ras Muhammed guarantees sharks on every dive. The soft corals are spectacularly colored. There are 150 species of stony coral. With over 1,000 species of fish, the incredible invertebrate marine life and flora, the Red Sea is the ultimate trip for the diver and photographer.

Excitement enters the safari in the form of a dive into the canyon, which bottoms out at 198 feet.

At 95 feet it is thrilling in form and mystery. Four people have lost their lives in the canyon. It is no surprise. A night dive in windy Dahab produces exquisite basket star fish, pencil urchins and sleeping parrot fish.



DAVID DOUBILET

The following day brings Ras Um Cid, where the plan is for an early morning dive and a noon dive. By mid-afternoon the tide will have receded so far as to leave a diver high and dry. From shoreline to the reef wall is either a good 50-yard snorkel or a treacherous stagger on the reef table, depending on the time.

The early morning dive places the divers in a current which saps energy. Coupled with the heat and sun this causes a late entrance and exit on the second dive. The walk over the reef table is straight out of Marquis de Sade.

But all is well, for in diversification and sheer beauty this site takes first prize. The wall runs deep and is heavily endowed. Visibility is 100 to 200 feet. Mammoth sea fans and table corals are sprinkled all over and anemones abound.

That afternoon the bus leaves for Ras Muhammed, the southernmost point of the Sinai. Ras Muhammed is a chunk of fossil coral which is attached to the mainland by a

land bridge. There is not a more bizarre, and at the same time, more beautiful, place on the planet.

Israel has designated Ras Muhammed, as well as many other areas of the Gulf, a nature reserve.

"The end of the earth," a diver calls it. No one lives here at the end of the earth. Not even Bedouin. There is no water. Two desert fox and an osprey appear. The only people who venture to this head of land are divers and patrolling Israeli military.

There is much excitement this evening because the safari yearns to camp on the edge of Ras Muhammed. There are also plans to do a transition dive in the early morning, entering the water just before sun rise and witnessing the nocturnal to diurnal changes.

Plans are interrupted.

Forbidden to camp at the edge of the fossil coral, the safari makes many last ditch efforts to stay. Some resort to disguises. The military also makes a stand. They say the restriction is to protect divers. An invasion force could come at any time to Ras Muhammed. It did once, they remind.

The safari offers titillating bribes. These range from J&B to wine to a dinner invitation. Chicken curry may not sound like a bribe, but at the end of a sun-burnt stretch of dead coral, it is a delight. Rebuffed, the safari retreats a short distance and falls asleep, dreaming of tomorrow, and sharks.

During the morning briefing, Rubi Eviatar, former underwater commando and chief diving instructor at Neviot, points out the destination, the second of two small atolls just off of shark reef. They are called shark islands. Just past the first atoll, Eviatar signals to stop snorkeling and descend. Considered a shark expert by some marine biologists, Eviatar senses a shark's presence before he sees it. One by one they appear, until we are being circled slowly and gracefully by four gray reef sharks—each about seven feet long. Never armed, Eviatar beckons them to come closer. The closest they come is 20 feet. The only shooting that is done in the Red Sea this day is through a 15 mm lens, and 20 feet is just not close enough.

Gray reef sharks are considered killers in the Indian Ocean. Eviatar contends that their relatively passive behavior in the Red Sea is due to the abundance of food. It is obvious that sharks and Eviatar hold a mutual admiration.

As this letter is written the news reports that Ras Muhammed may be returned to Egypt in less than six months. What are you waiting for?

Freelance writer Dianne Dubler is currently in the Red Sea region researching a book.

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Letter From

...Washington.

BY PHIL TRUPP

At a recent Washington cocktail party where gossip had the buzz of national policy, a respected ocean scientist asked if anyone could recall Jimmy Carter using the word "oceans" during his tenure at the White House.

We tried to remember—without any luck. The question went unanswered.

What a striking contrast to a similar scene in 1976. President Carter was taking over a demoralized government drained of credibility. Still, he had the courage to stand with his former colleague, Admiral Hyman Rickover, and promise a new era of ocean exploration, an era in which Americans would gain a new identity and a new mission.

We understood the problems he faced. Mr. Carter had to first rebuild the government and give it life. When this initial job was over he'd turn to the sea.

There was every reason to believe him. He was an ex-Navy officer closely associated with development of the nuclear submarine. He understood the need for innovation, and his relationship with Admiral Rickover must have instilled in him a positive spirit for it. So much for what we believed.

Today, the oceans are all but non-existent, a non-priority, in official Washington. Our bewildering economic problems make saving the dollar more important than going to the planets or colonizing the sea.

Mr. Carter is a political creature. Scientific exploration doesn't play too well these days in Proposition Thirteensville, and he knows it.

But not everyone in Washington agrees. There are powerful leaders in Congress who believe the President is missing a good bet. They say there's money to be made and prosperity to be gained in those early promises of a dynamic national oceans program—a "wet NASA."

This had occurred to Sen. Warren G. Magnuson (D., Wash.), Chairman of the Senate Appropriations Committee, which rules on budget requests by the National Oceanic & Atmospheric Administration. He also heads the blue-ribbon National Ocean Policy Study Group which pinpoints key issues. Undoubtedly "Maggie" is one of the most powerful men in politics today, and a pioneer in America's oceanographic enterprises. What "Maggie" wants "Maggie" gets.

Phil Trupp is Sport Diver's Washington connection. An experienced author and diver, Phil has spent 20 years covering the Washington scene for major publications.

The senator asked NOAA to draw up a comprehensive national oceans policy with long-range goals. It was to be relatively inexpensive but highly imaginative, a program people could identify with, and which Mr. Carter could endorse.

NOAA was given a year to put something on paper and present it to Commerce Secretary Juanita Kreps, who in turn would make a public announcement that America would turn its boldest efforts to the sea and derive direct economic benefits from it.

The policy writing job fell to Richard A. Frank, who was taking over as administrator of NOAA. Mr. Frank was a respected attorney with a reputation in "social law." He had been a somewhat obscure figure in the U.S. Law of the Sea Conference entourage. If Mr. Frank was a quiet figure, he was positively colorful compared to the classic low-profiler, Dr. Robert W. White, a weather scientist whose leadership had kept NOAA in the clouds since 1970. Dr. White wasn't really replaced; it was as if Mr. Frank appeared, and Dr. White simply evaporated.

Mr. Frank had gathered some very able assistants. Most were young and quick. Many were proven doers. How much or how little they knew about ocean exploration wasn't clear but it was hoped they'd know good ideas when they heard them.

More than a year passed, and still the program wasn't on paper. Finally, after more prodding, a tentative statement was written. It gave interesting statistics on fish populations and coastal management. It was a good piece of research. It had only one major flaw: it lacked imagination.

Senator Magnuson grew impatient. He sent an unofficial advisor to the agency to help out. Ironically, this advisor was no stranger to NOAA. He had visited agency officials many times with his ideas but had been repeatedly rebuffed. This time, Sen. Magnuson hoped history wouldn't be repeated.

The first interview lasted 15 minutes. But it was enough to make contact. One top NOAA official understood immediately that the advisor might be useful. Another interview was set with a high-ranking official in the Office of Policy and Planning, the unit directly charged with writing the policy statement.

During this second interview the advisor explained the notion of ocean "development" as opposed to ocean "exploitation." Oceans are not to be raped but rather developed to full productivity.

The task is too big and too important to

be left in the hands of a scattering of private individuals. Of course, the big oil companies were in good shape. But beneath them a whole legion of small entrepreneurs were struggling for existence. (It should be noted that even Cousteau, most successful of the "pop oceanographers," still must hustle to keep his mission alive.) Only the federal government, working with the states, had sufficient resources to bring careers, money, and jobs out of this vast unexplored region. Only a major commitment at the highest level of government could make it real, the advisor said.

We are a pragmatic people. We demand results and we insist on getting our money's worth. The advisor said the oceans would give back here on Earth rewards that the moon can never provide from a quarter-million miles away. The NOAA people nodded; pencils moved across yellow legal pads.

The advisor poured out his ideas: sonic herding of sea mammals for their milk; devices to ride herd on whole species of food fishes; underwater sensors to detect and give early warning of earthquakes around the world; a fleet of low-cost submersibles for energy exploration and research; a series of self-contained habitats along the mid-Atlantic ridge. These and other projects would capture the world's imagination.

Nearly three hours later, the interview ended. The advisor was asked to write a policy statement for Commerce Secretary Juanita Kreps.

But the advisor was never invited to NOAA again. Many telephone calls went unanswered. He talked to his friends on Capital Hill to find out what had gone wrong.

"You talked too much," he was told.

And to us he admitted, "I must have scared them."

Maybe so, because NOAA remains scared today. The policy statement is still a dream, and there is talk of dismantling the agency.

This is what worried the career oceans people who gathered at that Washington cocktail party and wondered if President Carter would ever use the word "oceans." The Outer Continental Lands Act mandated a new underseas program to be developed by the entire oceans community. But the act carries no funds. Any programs that grow out of it must be approved by Congress.

Regardless of the act or the outcome of the next Presidential election, it will be up to the oceans community to build its own power base. It must be a power base that can't be ignored.

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WASHINGTON *continued*

Sport divers are part of this community, and they have a special role. They understand their position relative to the unexplored universe of the oceans. Each time a diver descends, something is learned, something that may be shared. Diving is a sport but it is also a tool—a special tool for special people.

The oceans community understands that development of the sea isn't a liability any more than the \$20 billion spent on the moon program was a liability. Space created whole new industries, and industries within industries. Cities such as Los Angeles, Seattle, New Orleans and Houston enjoyed economic good times. Even if the moon project is over, much of its hardware and technology can be transferred directly to ocean exploration.

The oceans are here and now. If anything, the oceans are our single most important national asset. A program to develop them would be anti-inflationary because its aim would be to create a bolder economy and a spirit of national well-being.

We must insist on it.

Sea Grant Money Up

The federal Sea Grant program, which helps finance universities, groups and individuals working on marine-oriented programs, recently got a raise.

While the rest of the federal budget for oceans was drying up, Sea Grant received an additional \$3 million for cost-sharing projects during the current fiscal period. This is in line with President Carter's October 24 announcement that "basic" research wouldn't have to bite the bullet in his anti-inflation drive.

For more information, contact Dr. Warren Yasso, Office of Sea Grant, 3300 Whitehaven Street, N.W., Washington, D.C. 20235.

Here a Dump, There a Dump

If ocean dumping is 12 per cent less than it was a year ago, controlling where things get dumped remains a big headache.

According to Brian Chase, a Corps of Engineers worker, there is no intelligent cooperation between dumping contractors. Some contractors have dumped garbage directly over a research control site.

Speaking at the Oceans '78 Meeting here in Washington, Chase said Coast Guard ocean dumping surveillance systems are fine—when they're in use, which isn't nearly often enough.

At present, we pour everything into the sea from solid waste to nuclear materials. But apparently dumping contractors believe it's asking too much for them to be somewhat less indiscriminate. They call it "intervention."

Next time you're on the bottom, take a moment to look up. There may be some unexpected goodies coming your way.

continued

Learn how to capture all the thrills and beauty of diving with your camera!

Underwater Photography for Everyone

by Flip Schulke

Two million sport divers now enjoy the delights of photographing the world beneath the sea. And with the advances taking place in underwater camera technology, taking pictures underwater is no longer limited to scuba divers with expensive, sophisticated gear.

Thanks to molded plastic camera housings, underwater photography is now within easy reach of every swimmer with a mask and flippers. Beginning with the camera you already own, be it a pocket instamatic or a 35mm single-lens reflex, *Underwater Photography for Everyone* guides you from backyard pool to

use for still and cine photography • Safety precautions when photographing underwater • How to compose dramatic pictures that include fish,



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marine vegetation, and other divers • Techniques of using a light meter underwater • How sky, cloud, and turbidity conditions affect underwater photography • How the color content of light changes at different depths • The uses of battery-powered movie lights.

Renowned author Flip Schulke shows you how to use the many types of complex underwater cameras and housings, as

well as the techniques of natural and artificial lighting and other advanced elements of

underwater photography. He illustrates his points with a dazzling assortment of black-and-white and color photos, many of which were featured in national maga-



◀ The Kodak super-8mm model XL 330 movie camera in Ikelite housing.

zines. Exercises at the end of each chapter help you put into practice the skills Schulke has developed over the years.

Examine this outstanding book at our expense for 15 days. Then, if you like what you see, you may purchase *Underwater Photography for Everyone* at a 20% discount off the publisher's price—a special saving available only to readers of *Sport Diver*. Mail the coupon today to begin your experience with Schulke's dynamic teaching techniques!

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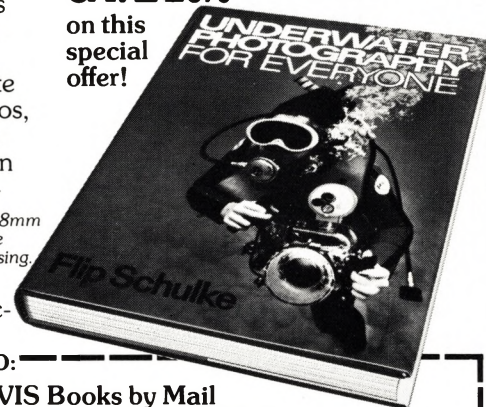
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WASHINGTON *continued*

Marjorie MacCallister Raised

For years the ocean-going tug *Marjorie MacCallister* has been a real treat for divers of the North Carolina coast. But no more!

That gorgeous, intact wreck looked like 125 feet of the best Hollywood movie set you ever saw. Now, floating upside down in Moorehead City harbor, she is to all the world a huge encrusted turtle for sale to the highest bidder.

The *MacCallister* was raised by an independent group of Carolina salvage divers, the same divers who tipped off Washington that the *U-352* was dangerous. There was some speculation the tip was a lead-in to a possible government contract to inspect the sub. Rumor had it the *U-boat* was carrying a good deal of hard currency.

That rather cynical speculation was put to rest and the Navy was picked to look over the sub. The salvage divers then started on the *MacCallister*, the raising of which is no less than underwater technical genius.

There is speculation that the torpedoed freighter, *Papoose*, may be the next target. The freighter lies intact in 120 feet of clear Gulf-stream water and is ripe for salvors.

We hope more sites aren't going to vanish for profit. Free enterprise is fine. But these wrecks represent history to a future generation.

New Scuba Booster on the Hill

Newly elected Republican senator from Virginia, John W. Warner, has been a friend to sport divers here in Washington. A year ago, Warner donated a full line of equipment to St. Alban's School to begin scuba training.

Warner, however, isn't a diver. A life with his wife, former actress Elizabeth Taylor, must keep him pretty busy.

But rumor here has it that Liz may soon hook up to tank and regulator. Recently she was seen wearing a tee shirt that said, "Eat Your Way Through a Reef."

Mobile U/W Lab is Killed

The concept of an autonomous, self-propelled manned ocean-going habitat/laboratory has been written off in a "policy move" by National Oceanic & Atmospheric Administration officials.

The so-called "Ocean Lab" system would have cost about \$50 million to build and operate over a specified period of time.

Unfortunately, the system is still another victim of the innovation recession which has characterized NOAA for years.

It is now up to agency planners to re-think the project and find ways to use existing hardware such as saturation bells, ships and submersibles.

Race For The Titanic

Film makers are in a race to find the *Titanic* and produce a box office smash.

One group, known as Big Events, is located in Sausalito, Calif. The other is at Woods Hole, Mass., and Washington. Friends of Jimmy the Greek are betting 3-to-1 on the Woods Hole-Washington combine because of its tie-in with *National Geographic* photographer Emory Kristof.

Finding the famous wreck, which lies in 12,000 feet of sunless water, somewhere in a 100-square-mile patch of ocean off Newfoundland, will take a lot of luck and a lot of money. *National Geographic* has both.

Though the National Geographic Society has a reputation as a highly conservative outfit, it did fund an all-out search for the Loch Ness monster, with Kristof heading the film crew. If the Society went after Nessy there is no reason to suppose it won't back the equally uncertain challenge of finding the *Titanic*.

The California group is headed by promoters Spencer Sokale and Joe King. The Woods Hole-Washington unit is headed by diver-geologist Robert Ballard. Besides having Kristof and *National Geographic* in his corner, Ballard also has the cooperation of William Tatum, vice president of the *Titanic* Historical Society. Woods Hole is also a part of the equation, though its exact role is uncertain at this time.

Sokale and Ballard were said to be partners in the *Titanic* venture. They later split, reportedly because of disagreements over how to produce and market the film. Sokale has reportedly discussed the matter with attorney Melvin Belli. Ballard says he hasn't foreclosed another partnership deal with Sokale's Big Events.

If Sokale and Joe King agree to a documentary rather than a "Towering Inferno" treatment, the groups may once again join forces.

Still, *National Geographic* is the key. If it helps back the *Titanic* expedition we may soon have a box office attraction to rival *Jaws*.

"We're going to redirect the program," one NOAA official said. "The lab may have been a sexy idea. But how many people could afford to use it?"

Not many, according to those who believed the mobile lab was merely a "super gadget" designed to capture public attention.

They said use of existing hardware will be cheaper, more effective and lead to an expanded man-in-the-sea program.

On Capital Hill, proponents of the lab took another view. They said the concept had possibilities far beyond present technology, and \$50 million was hardly an outrageous price these days.

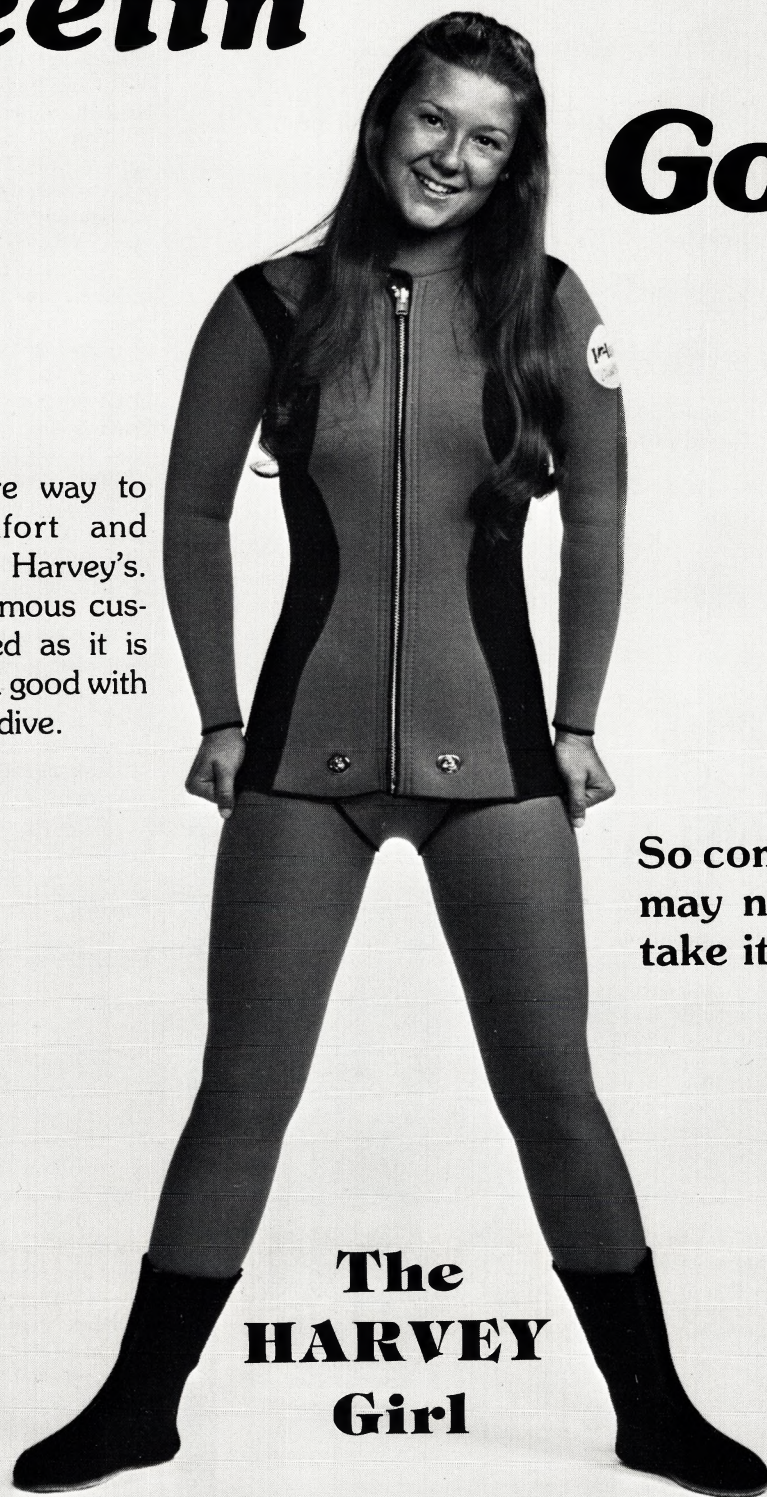
Scrubbing the lab was "typical NOAA," said one source.

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WASHINGTON *continued*

U-352—Hazardous to Your Health

The World War II German submarine U-352 has been inspected and declared "extremely dangerous" by Navy UDT experts.

They warn sport divers to stay away until the sub's live ordnance can be defused.

The off limits poster is strictly unofficial, however. The sub lies in 110 feet of international water off the coast of Moorehead City, N.C., and there are no enforceable laws to keep divers away.

"The U-352 is an accident waiting to happen," one Navy official said.

Particularly dangerous is an armed torpedo jutting from an aft tube. A heavy hammer or a bang stick could make it blow.

The boat is also bristling with live 88-millimeter ammo. Inside the hull self-destruct mechanisms may be booby traps.

Over the years, hundreds of sport divers have visited the site without mishap. Some claim the Navy is overreacting. Behind this claim is the fear that the Navy will simply blast the sub out of the water.

But Senator Lowell P. Weicker (R., Conn.), who visited the site in July and called in the Navy for an expert assessment, is adamantly opposed to destruction of the U-352. He insists the "magnificent artificial reef" must be defused and preserved.

But the sub is more than a reef. It is the final resting place for at least 11 crewmen. Bonn considers it a war shrine. Any action by the U.S. must have the backing of the German government, which owns the vessel.

It is understood that Bonn will approve any means of removing the ordnance.

That's good news for sport divers. The U-352 will be around for us to enjoy—provided some heroic diver doesn't get careless before the time bombs are defused.

Poles Apart

There's a north and a south pole, right?

It depends on who you ask. For instance, the august National Science Foundation doesn't always act as if the earth had two polar regions. Critics say NSF concerns itself only with grants for Antarctic research.

"If you want to do under-the-ice research up north, forget it," one Washington scientist tells us. "NSF has a drawerful of excuses."

That's a shame, and more than one congressman is wondering if something might be amiss in this one-pole outlook.

Important undersea research needs doing in places such as Prudhoe Bay, where much of big American oil has set up operations. Researchers here claim there's visible pollution under the northern ice, and that marine life is threatened.

If this fact rubs the oil companies the wrong way, so be it. We can't ignore the facts, and certainly we need more of them.

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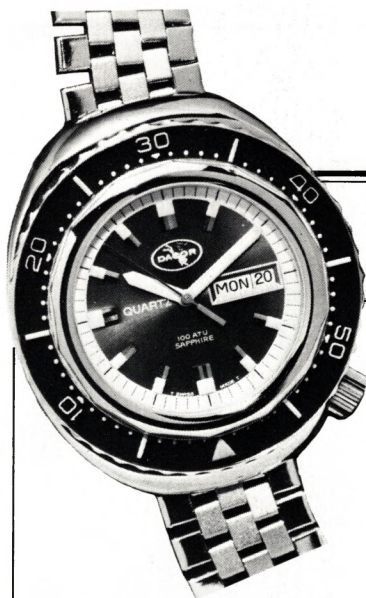
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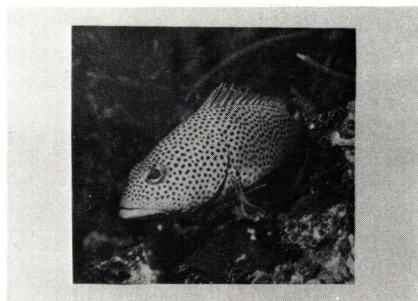
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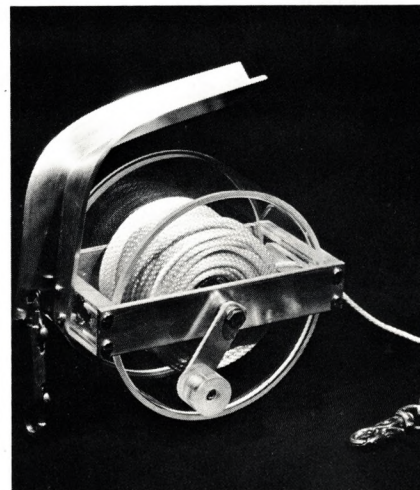


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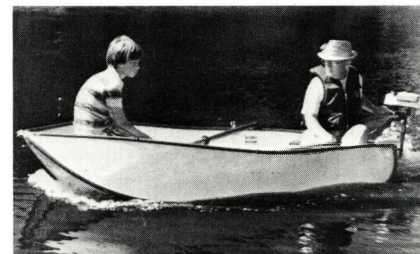
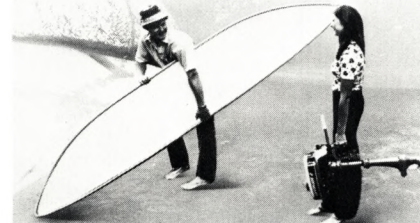
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NEW & IMPROVED *continued*



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Fold Up Boat. Porta-Bote is a rigid, 10-foot boat that folds into a surfboard-shaped package just four inches thick. With a 52-inch beam, the craft unfolds and is ready to go in as little as two minutes. Constructed of polypropylene, Porta-Bote is Coast Guard certified and comes with a 10-year hull warranty. Takes outboard motor or can be used with optional sailkit. K Enterprises, P.O. Box 2287, Menlo Park, CA 94025.

the slow dive \$290



Choose the diving vacation that will make you feel you've been away twice as long...the slow dive.

It's at Beach Club Colony, on the middle of Seven Mile Beach, Grand Cayman Island—one of the top rated dive areas in the world, with spectacular visibility and vertical wall diving in the warm Caribbean Sea.

Out of the water, you'll have time to read and relax in the sun. Or fill time to overflying with tennis, sailing, water skiing, and cruising the currents in our Reflections Disco.

Get it all this winter for 7 days, 6

nights for \$290 per person, double occupancy, on our Cayman Scuba Treasure Vacation. Certified divers package includes two-tank dives each day, all equipment, Dive Master and boat as well as lots of other time-stretching, smile-fetching treasures.

The Cayman Islands will make you forget how crowded the world is everywhere else. And our Carib cuisine may make you want to stay on the slow dive.

Call your travel agent.

For brochures and information, write: Beach Club Colony, P.O. Box 898, Miami, Florida 33133.

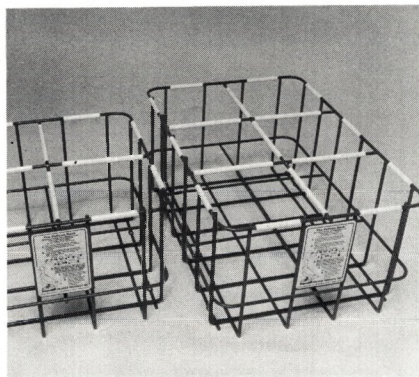
BEACH CLUB COLONY



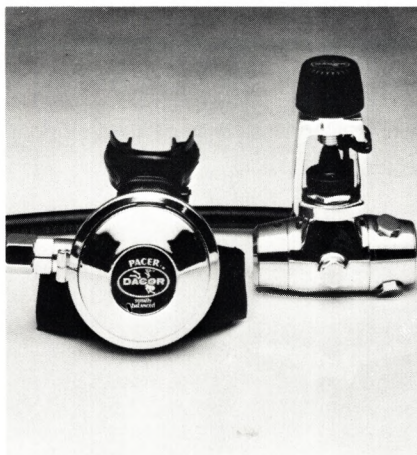
DEPT. SD



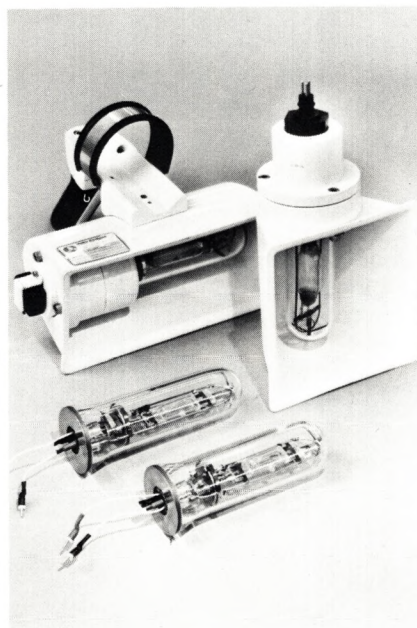
Time to Get Wet with Scubapro's new automatic winder. Pressure tested to 1,650 feet, it features flush-mounting stem and matching or contrasting bezel. Specially contoured stainless steel case protects crystal. World-wide Scubapro Warranty. **Scubapro, 3105 E. Harcourt, Compton, CA 90221.**



New Pelican Racks are Stronger and Lighter. The Pelican Tank Racks have gained 16 arc welds and lost two pounds for 1979. New anti-rattle sleeves are molded white nylon and cover a wider area for additional tank protection. **Pelican Products, 23763 Madison Street, Torrance, CA 90505.**



New Pacer Regulators Breathe Easy. The result of three years of research, Dacor's new Pacers use the venturi principle to closely reproduce on-surface natural respiration at any depth. The Venturamatic system controls the free flow and surging that affected previous high-volume regulators. Available with redesigned first stage with more high and low pressure ports, swivels for convenient hose placement, balanced diaphragm and piston units. Four models are now in production from \$115 to \$165. **Dacor, 161 Northfield Road, Northfield, IL 60093.**



SeaStar Gas Discharge Bulbs Require No Ballast, maximizing the advantages of both conventional gas discharge and incandescent lights. Operating from 115 volt AC or DC, SeaStar generates high efficiency Mercury vapor spectral output, well suited to attenuation characteristics of water and is available in general purpose or diver-held assemblies. **Hydro Products, P.O. Box 2528, San Diego, CA 92112.**

The shortest distance between two points underwater.



You're down 55 feet and 350 feet from the support boat. It's time to get back. Time to find the boat. But you stay down to avoid a rough surface swim. You know a Wet Beacon[™] marker is secured to the anchor line. It's sending out an ultrasonic pulse. And you scan for the pulse with your Wet Finder[™], the hand-held, lightweight receiver. Within seconds the Wet Finder LED signal hones in on the marker, fixing your direction. When you surface, you're 4 feet from the bow. Perfect. You're glad you weren't depending on a compass.

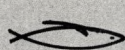
The Wet Beacon/Wet Finder diver navigation system. It's new, it's reliable, it's incredibly accurate. It's available at local dive shops.



WET-BEACON[™]
WET-FINDER[™]

If unavailable, write or call: Conquest Marketing Co., Inc., 3176 Pullman St., Suite 110, Costa Mesa, CA 92626. (714-540-2323). Manufactured by Sound Waves Systems, Inc. Dealers ask our sales representatives for a demonstration.

continued



LIVESAY

Livesay has been building custom boats for sport and commercial divers, fishermen and governmental agencies for 25 years.

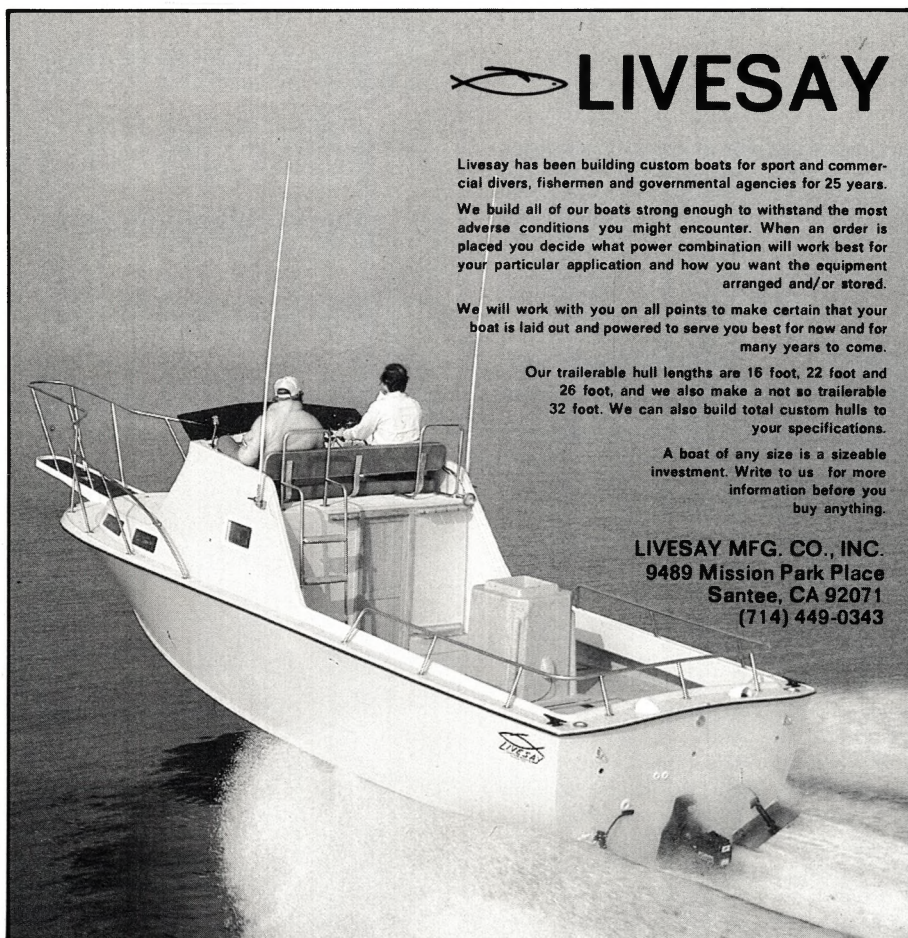
We build all of our boats strong enough to withstand the most adverse conditions you might encounter. When an order is placed you decide what power combination will work best for your particular application and how you want the equipment arranged and/or stored.

We will work with you on all points to make certain that your boat is laid out and powered to serve you best for now and for many years to come.

Our trailerable hull lengths are 16 foot, 22 foot and 26 foot, and we also make a not so trailerable 32 foot. We can also build total custom hulls to your specifications.

A boat of any size is a sizeable investment. Write to us for more information before you buy anything.

LIVESAY MFG. CO., INC.
9489 Mission Park Place
Santee, CA 92071
(714) 449-0343



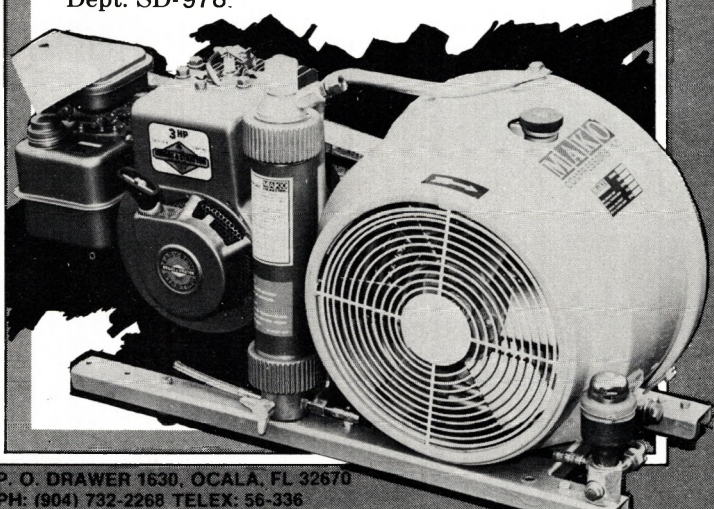
NEW & IMPROVED *continued*



Submarex Precisa Gauges. Two new depth gauges by Submarex, the Precisas, offer important advances. Patented external adjustment allows divers to make minor calibrations without special tools. All parts are non-magnetic and diamond tool finished. Two copper-beryllium diaphragms read 0-35 feet and 35 to 260 feet respectively, transmit their readings via a four jewel Swiss movement. Available with full-luminous dial in black chrome case, or with luminous markings in mirror chrome case. General Diving Corp., 500 W. 18th St., Hialeah, FL.

PORTABLE

Remember that remote diving site? Our Purus can put you there again. Fills a 71cf tank in 24 minutes. For more information on the Purus or larger systems, contact Mako Compressors, Inc. Dept. SD-978.



P. O. DRAWER 1630, OCALA, FL 32670
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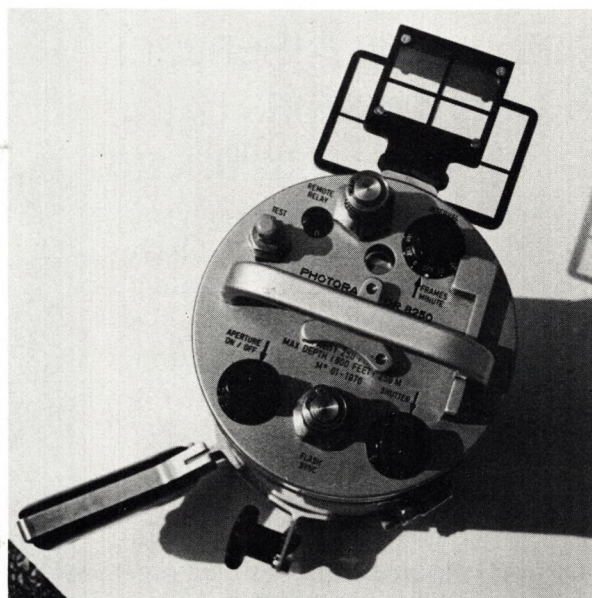
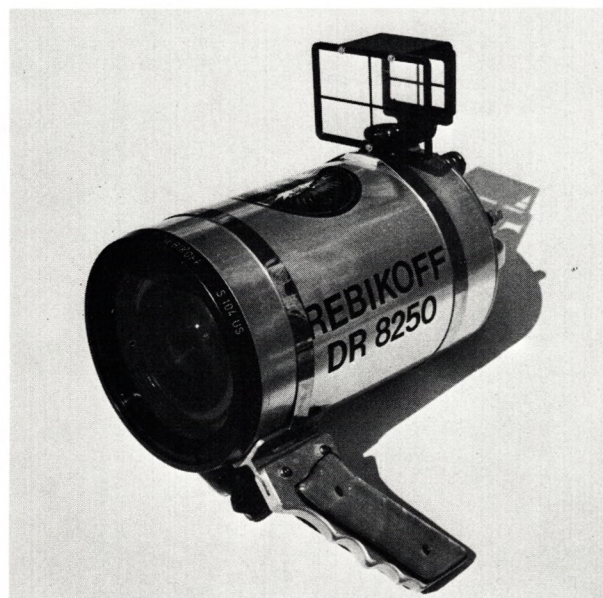


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REBIKOFF MACRO-MOTOR DR-8250

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2 flashes per second up to 1/125 seconds synch
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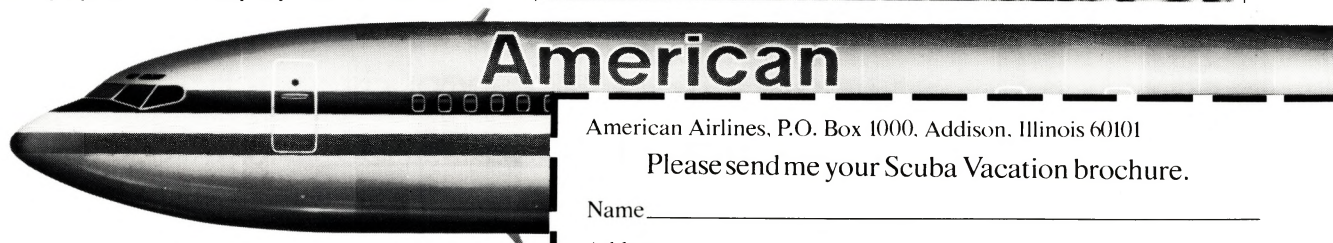
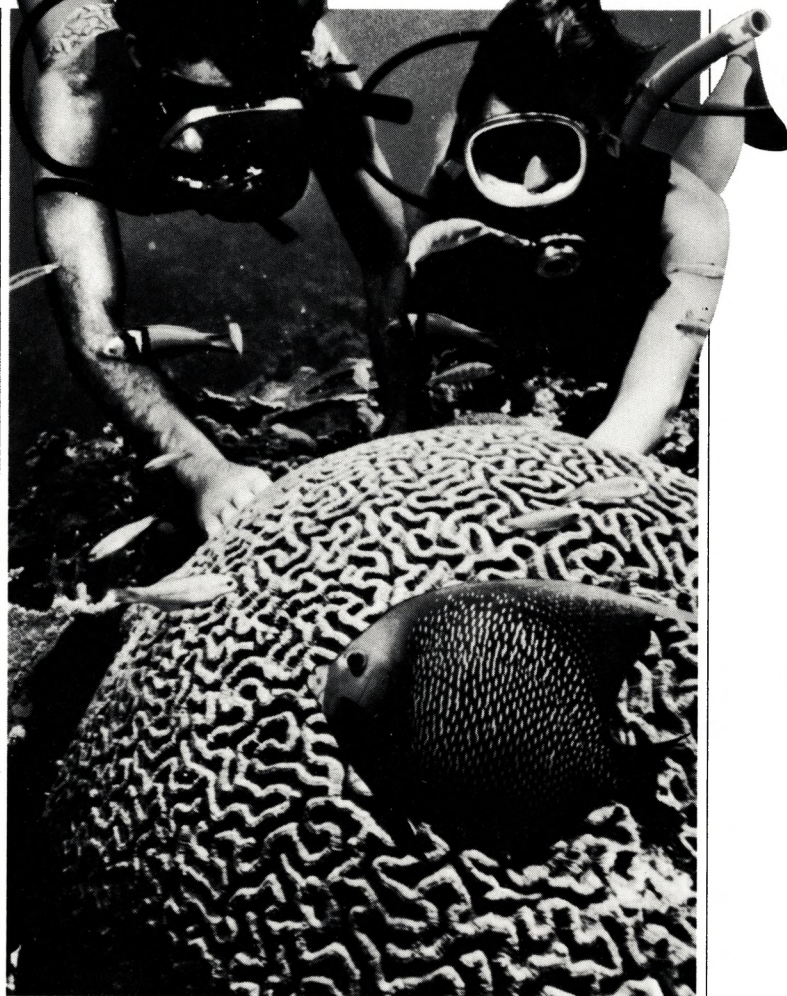
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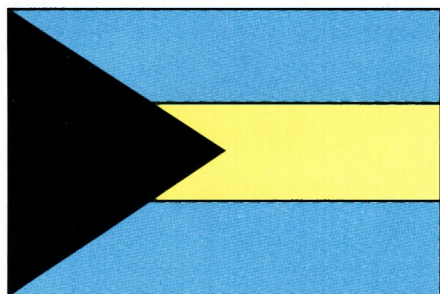
Address

City State Zip

My Travel Agent is

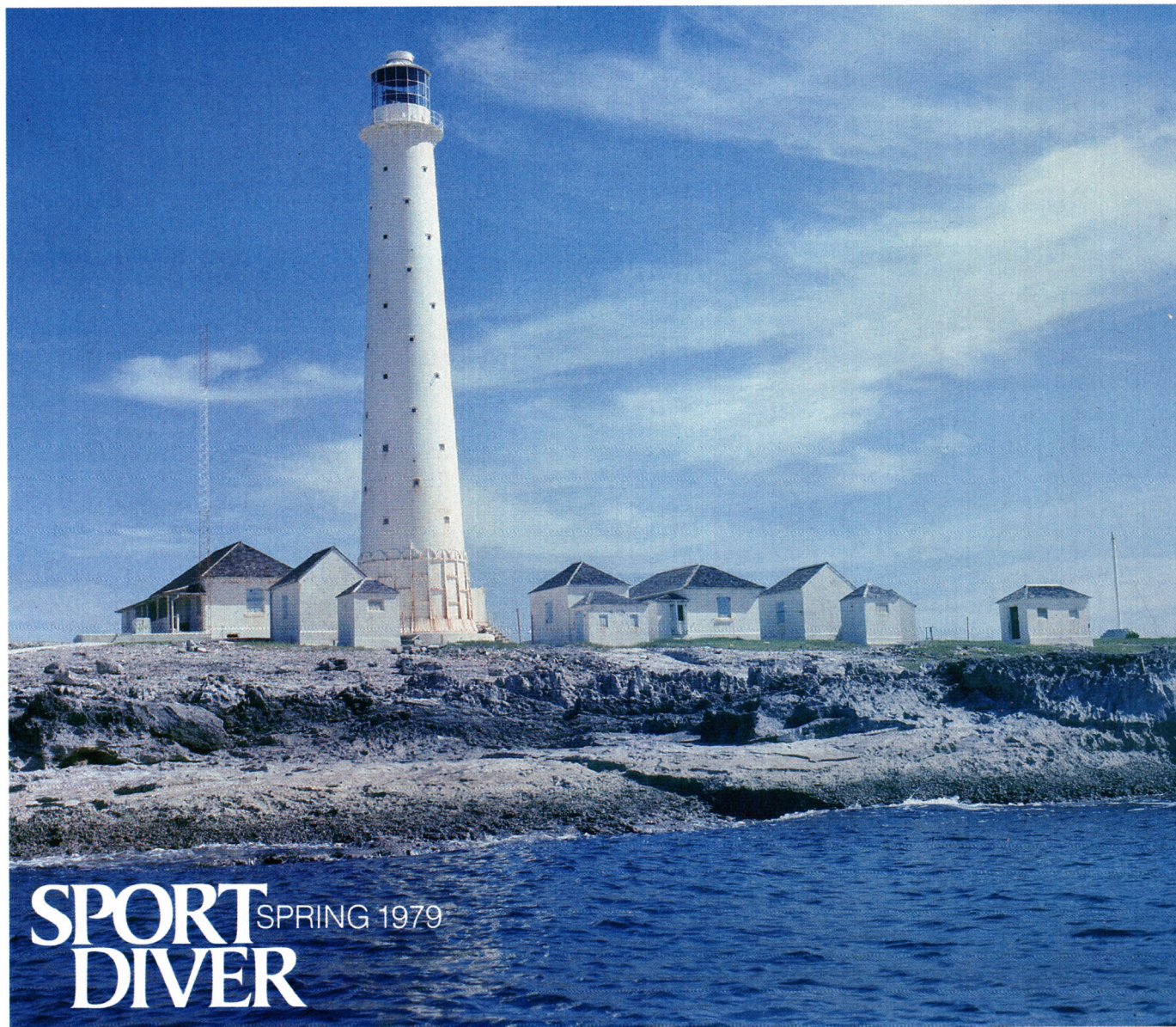
THE BAHAMAS

The First Complete Guide
to the Diving Resort Destinations of:



The Bahama Islands are the American divers' favorite vacation destination. The reason: the range of resorts and services offered here is as diverse as the diving.

TEXT BY JAMES DUNCAN
RESEARCH BY JOHN WALSH



SPORT SPRING 1979
DIVER

RICHARD STEWART



RICK FREHSEE

ELEUTHERA, HARBOUR ISLAND, SPANISH WELLS

From Cape Eleuthera marina, it's only two and a half miles to the lip of the Eleuthera wall, which starts in 55 feet. The craggy reef plunges sharply, the drop off covered with huge, colorful sponges and large plate corals. A World War II sonar cable hangs into the abyss, its length covered with corals, sponges, and gorgonians.

Inland, there are blue holes. Ex-

James Duncan is a freelance travel writer who specializes in vacation diving destinations.

The sea life that swarms the great Eleuthera Wall provides hours of fascinating discovery. Large basket stars (left) inhabit both shallow and deep reefs. A shy squirrelfish (opposite) hangs motionless beside its elkhorn castle.



RICHARD STEWART

perienced divers can explore the maze of stalactites, densely populated with marine life.

Barely 100 yards offshore, a shallow reef yields coral heads towering 15 feet above the sandy bottom. The reef is patrolled by schools of grunt and snapper. Hogfish peck for mollusks on nearby sand bars, a tempting target for the after-dive fisherman.

The picturesque settlements of Eleuthera provide grist for the tourist's mill, and there is nighttime entertainment, usually Bahamian musicians, at some resorts.

Off the north end of Eleuthera divers may choose between the wrecks of a 180-foot freighter in 25 feet of water, or the famous train wreck where the carriage and wheels of railway cars lie scattered in about 15 feet of clear, green water.

At the Glass Window, a seaside cave has been formed by the action of waves on the limestone cliffs. The natural bridge that once spanned the cut here fell into the water after a violent storm, and the boulders create an unusual bottom topography.

Riding the current that sweeps through the cut between Eleuthera and Current Island is popular. When the tide changes, the water here can move as fast as six knots, sweeping divers through a 55-foot deep channel filled with rays, barracuda, grunt, snappers, and lobsters.

The reef off Spanish Wells known as Devil's Backbone is literally covered with wrecks. The misfortune of errant skippers who fetched up on the spectacular corals now provides divers with a source of endless discovery and pleasure.





ELEUTHERA/HARBOUR ISLAND/ SPANISH WELLS

GENERAL

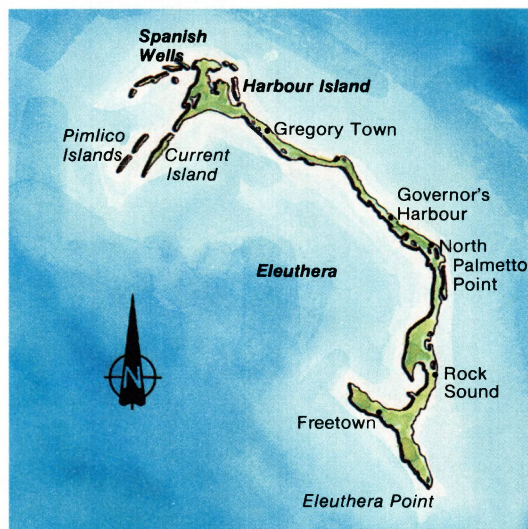
Location: 50 miles east of Nassau
 Size: 164 square miles
 Topography: hilly island with seaside cliffs
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 10,000
 Largest towns: Rock Sound, Cape Eleuthera

DIVING

Water temperature: winter 75-85, summer 75-85° F
 Visibility: 110-120
 Depth of dives: 15-250 feet
 Currents: 0-6 knots
 Tidal fall: 3 feet
 Types of diving: reef, wreck, wall, night, drift, coral gardens, drop-offs, blue holes, grottos
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 3
 Diving craft: excellent
 Sights:
 Fish: groupers, snappers, tropical reef fish, parrotfish, rays, marlin, sailfish, wahoo, dolphin, amberjacks, shark, barracuda
 Coral: fire coral, brain corals, stony corals, black corals, soft gorgonians, black coral trees, sea plumes, brain, lettuce, star, button, elkhorn, staghorn
 Sponges: seafans, seaweeds, tube sponges, cup sponges, basket, vase
 Invertebrates: coral shrimp, arrowcrabs, nudibranchs
 Restrictions: No spearfishing with scuba

DIVING SERVICES

Instruction available: resort course, open-water certification, advanced open-water certification, underwater photography
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment sales: mask, fins, snorkel
 Equipment repair: good
 Camera repair: none
 Air: to 5000 psi
 Guides: excellent



DIVERSIONS

Ground transportation: taxi, rental car, motorbike
 Shopping: good and reasonable
 Restaurants: excellent and reasonable
 Nightlife: good
 Other sports: sailing, fishing, golf, tennis
 Don't Miss: Cape: Lighthouse 80 feet above pink sand beach; caves

JUST IN CASE...

Hospitals: Governor's Harbor: 332-2774; Harbor Island: 333-2227 Rock Sound: 334-2226; Cape Eleuthera: 334-2152
 Police: Governor's Harbor & Harbor Island: 332-2111; Rock Sound: 334-2244; Cape Eleuthera: 334-2152

PLANNING

Diving tours: Cape Eleuthera Resort, P.O. Box 528500, Miami, FL 33152; Current Club Hotel, Current, North Eleuthera, Bahamas; Romora Bay Club, P.O. Box 146, Harbour Island, Bahamas; Valentine's Yacht Club & Inn, P.O. Box 1, Harbour Island, Bahamas; Robert's Harbour Club, P.O. Box 31, Spanish Wells, Bahamas; Winding Bay Drive Center, P.O. Box 90, Rock Sound, Eleuthera; Islandia, P.O. Box 40, Rock Sound, Eleuthera

Land tours: See your travel agent

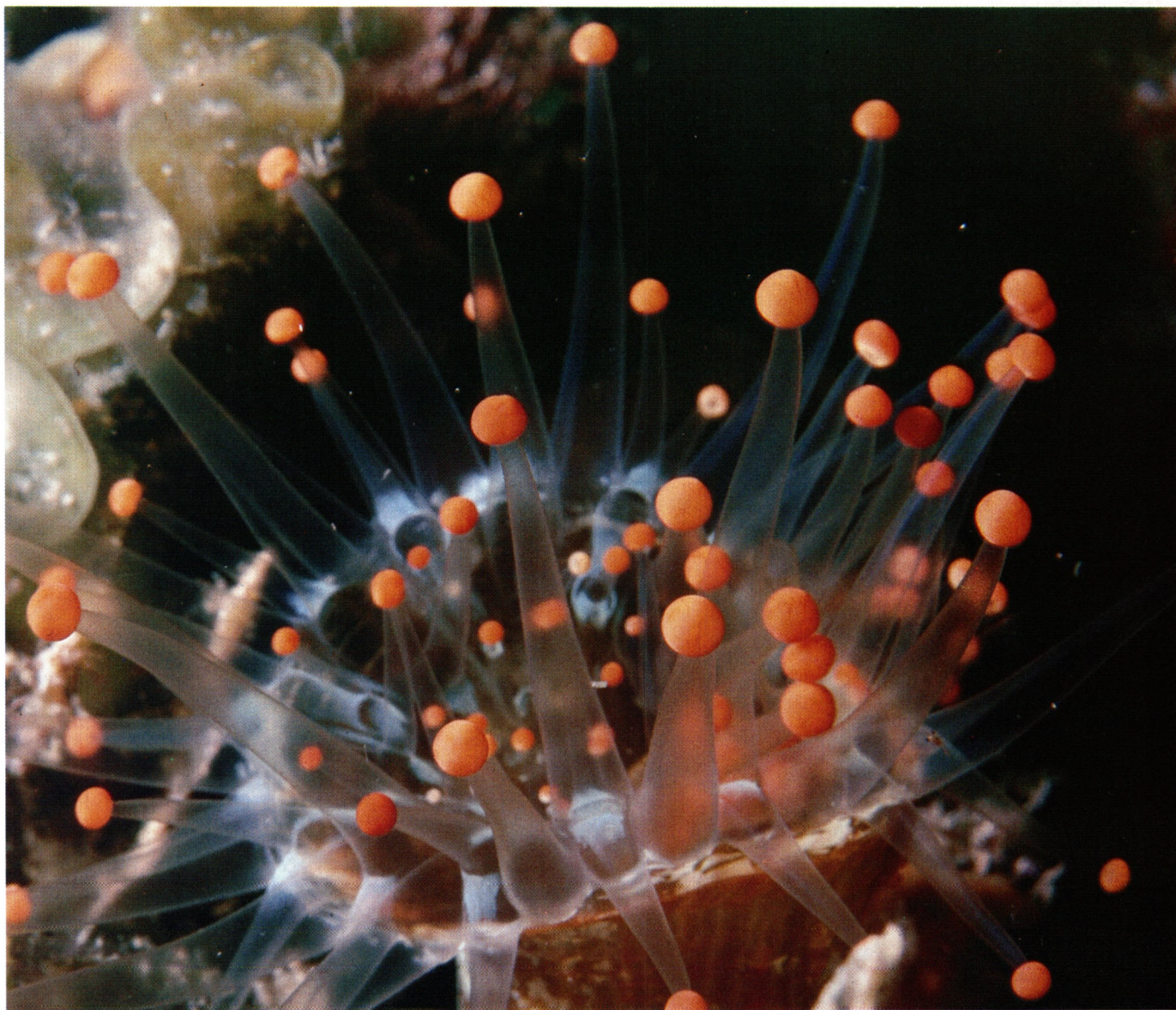
On your own: Airlines—Shawnee, 3212 S. Fed. Hwy, Ft. Lauderdale, FL; Mackey International, Ft. Lauderdale Airport, Ft. Lauderdale, FL; Bahamasair, 255 Alhambra Circle, Coral Gables, FL; Air Florida, 3900 N.W. 79 Avenue, Miami, FL

Airports: Rock Sound, Governor's Harbor, North Eleuthera

Marinas: Sawyer's Marina on Spanish Wells; Current (809) (33) 32290; Town Dock Harbour Island; Davis Harbour; The Pond at Hatchet Bay

Accommodations: Cape Eleuthera Resort & Yacht Club, Powell Point, Box 48, Rock Sound, Rock Sound (809) (33) 42275; Current Club—Ph: Current, Eleuthera; Coral Sands Hotel—(809) (33) 32320 & 32350; Ocean View Club—Box 134 Harbour Island; (809) (33) 32276; Romora Bay Club—Box 146 Harbour Island, (809) (33) 32325; Roberts Harbour Club—Box 31, Spanish Wells, Ph: 297; Roberts Beach Club—Box 31, Spanish Wells, Ph: 297; Bahama's Islandia—Box 40, Rock Sound, (809) (33) 42096; Cotton Bay Club—Rock Sound, (809) (33) 42101; Windemere Island Club—Box 25, Rock Sound, (809) (33) 22566; Winding Bay Beach Cottages—Box 93, Rock Sound, (809) (33) 42020

For information regarding languages, ethnic composition, economy, diving season, tourist season, recompression facilities, marine rescue, American Express, U.S. Consulate, Customs regulations, and a bibliography, refer to the specifications on page 69.
 Where a notation "fair," "good," or "excellent" appears after an item, such as guides or diving craft, it refers to the *availability* not the quality of the services.



STEVE LUCAS

*Strange formations, both natural and man made seem to surround Bimini. This very unusual anemone (above) attracts scarcely more notice than the Bimini road blocks (right). The blocks may or may not prove that an early civilization inhabited the island. Ample proof of the quality of sea life that now inhabits the area can be had at Hawksbill Reef, the wreck of the *Sapona*, or on the edge of the Bimini Wall.*

BIMINI, GREAT HARBOUR CAY, CHUB CAY



RICK FREHSEE

The name Bimini rings with legend. It is where Adam Clayton Powell sipped whisky and milk at the End of the World Bar while Congress fumed. Here, Hemingway rescued his son, Gregory, from a hammerhead. Flipper trainer Ric O'Feldman tried to free the porpoises penned at Bimini's Lerner Marine Laboratory, only to be jailed himself. Not a

continued



RICK FREHSEE

Extra large gamefish, like this Nassau grouper have built Bimini's reputation as the sportfishing capital of the world. The droves of charter boats that cruise Bimini regularly have fostered an atmosphere that is unique to the island.



RICHARD STEWART

year passes without a record fish caught in the Gulfstream offshore, or on the bonefish flats to the East.

Everything except diving brought sun-seekers to Bimini. Now the secret is out. The blue waters welling up from the depths of the Gulfstream have nurtured 90 miles of reef as lush as any in the North Atlantic.

Alicetown, North Bimini, attuned itself to fishermen, sailors and artists lounging ashore. King's Highway is a funky museum of sounds and smells, of conch fritters frying and bar maids serving "cold Girls (beer)."

Whether from the land-based Bimini Undersea Adventures or one of the numerous charters available from Florida, boats drop their experienced divers onto the Bimini wall for a drift dive. At 140 feet the current carries you along a shelf rich in colorful growth, with clear water above and a thousand feet of deep blue infinity below.

At the edge of the Bahama bank where it plunges into the Gulf Stream, Hawksbill Reef offers large coral heads, sponges, and fish life in depths from 30 to 80 feet.

The massive stones known as the Bimini Road continue to attract both sport divers and scientists, who speculate on the connection of this apparently man-made formation with some unknown civilization.

When northers blow against the flow of the Stream, the wreck of the *Sapona* invites divers to the protected waters inshore. The superstructure of the old concrete-hulled vessel towers above the water, its sides pock-marked by the bullets of World War II fighter pilots, who used the *Sapona* for target practice. Unexploded bombs have been found inside the hull, covered with the same russet and indigo colored growth that blankets the wreckage.

Eighty miles farther east of Bimini, Chub Cay sits at the northern end of Tongue of the Ocean. Mamma Rhoda Rock, just west of Chub, serves as a locator for several reefs covered with large staghorn corals. Crevices and gullies behind the rock conceal many lobsters.

A ledge, in 70 to 90 feet, begins just west of Mamma Rhoda and drops into the Tongue of the Ocean. It runs east past Whale Cay and on to Great Harbour. Whale Cay is private, and Great Harbour has no land facilities. Good diving exists off both, but presently it may be reached only by charter boat.



BIMINI/GREAT HARBOUR CAY/ CHUB CAY

GENERAL

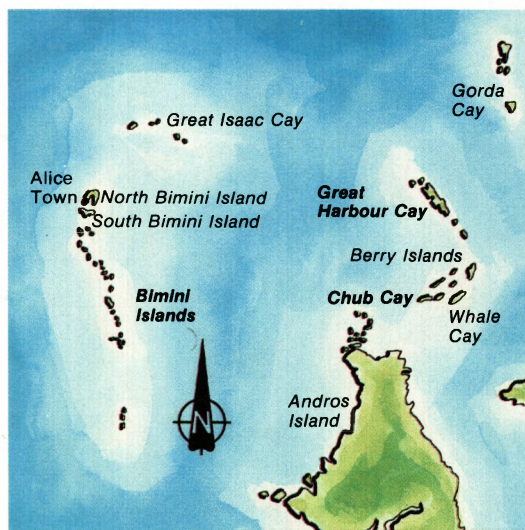
Location: 60 miles east of Miami and 120 miles northwest of Nassau
 Size: 9 square miles
 Topography: a flat island
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 3,000
 Largest towns: Alicetown

DIVING

Water temperature: winter 75-85, summer 75-85 °F
 Visibility: 110-120 feet
 Depth of dives: 15-250 feet
 Currents: vary, 0-3 knots
 Tidal fall: 2 feet
 Types of diving: reef, wreck, drift, coral gardens, drop-offs
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 3
 Diving craft: excellent
 Sights:
 Fish: groupers, snappers, tropical reef fish, stingrays, spotted eagle rays, jack, moray eels
 Coral: fire coral, brain coral, stony coral, black coral
 Sponges: seafans, seawhips, tube sponges, cup sponges
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course, open-water certification
 Equipment rental: mask, fins, snorkel, weight belt, weight tank, backpack, regulator
 Equipment sales: mask, fins, snorkel
 Equipment repair: fair
 Camera repair: none
 Air: to 2750 psi
 Guides: good



DIVERSIONS

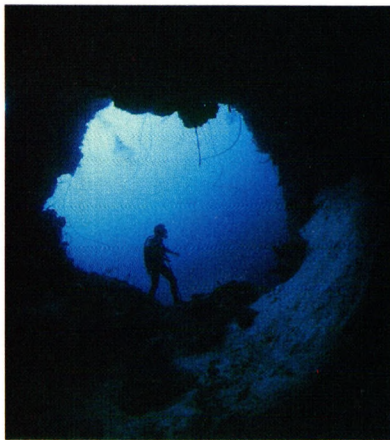
Ground transportation: none
 Shopping: fair and reasonable
 Restaurants: good and price varies
 Nightlife: good
 Other sports: fishing, tennis

JUST IN CASE....

Hospitals: 347-2210
 Police: 347-2144

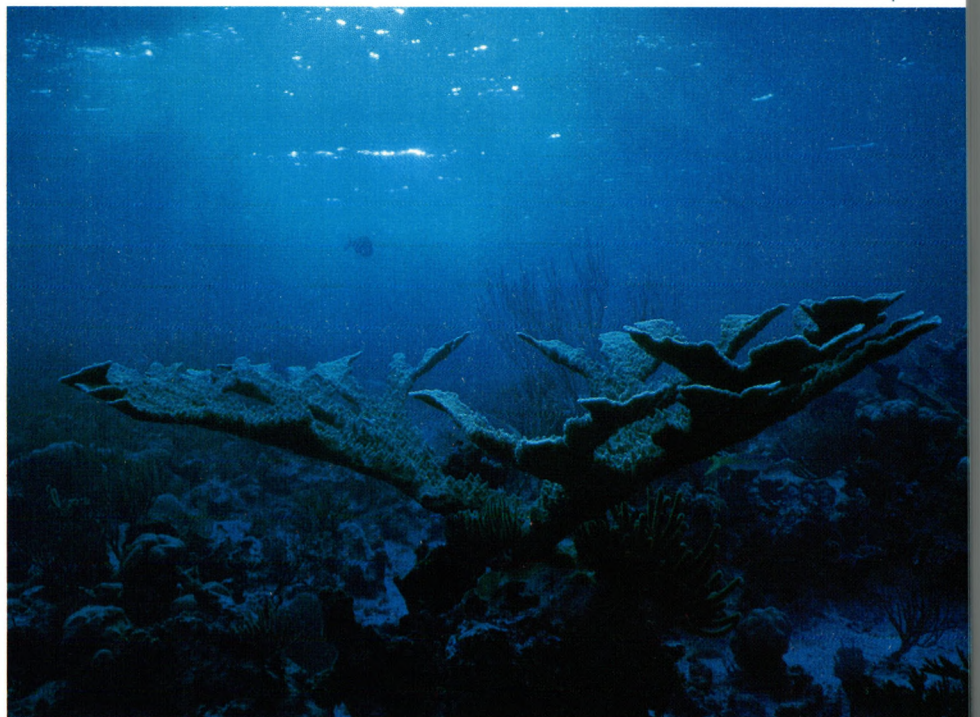
PLANNING

Diving tours: Bimini Undersea, P.O. Box 4960, Ft. Lauderdale, FL 33338; Highlander IV, P.O. Box 22284-S, Ft. Lauderdale, FL 33335; Seaventure Int'l., P.O. Box 1262, Melbourne, FL 32901; Sea Fever Diving Cruises, P.O. Box 1335, Key Largo, FL 33303
 Land tours: See your travel agent
 On your own: Airlines—Shawnee, 3212 South Federal Highway, Fort Lauderdale; Chalk's, MacArthur Cswy, Miami Beach, FL; Mackey International, Fort Lauderdale Airport, Fort Lauderdale, FL
 Airports: South Bimini
 Marinas: Bimini Big Game Fishing Club—Alice Town, North Bimini; Brown's Hotel—Alice Town, North Bimini; BlueWater—Alice Town, Weech's Dock—Alice Town, Buccaneer Point Club—South Bimini
 Accommodations: Bimini Big Game Fishing Club; Compleat Angler; Brown's Hotel



DAVID DOUBILET

Schools of yellow grunt mob divers on Andros' shallow elkhorn reefs. With perhaps the densest stands of elkhorn in the Bahamas, Andros is the shallow water diver's dream, yet it has more to offer. Deep on the wall, shafts bored into the reef fascinate. At Hole-in-the-Wall, a diver is framed against the bright blue of tropic waters (above).



DAVID DOUBILET



Atlantic slices asunder the shallow bottom of the Bahama Bank. To drop over the lip here is to learn the meaning of "abyss." Large predators drift through the cobalt depths, wary of intrusions into their territory. Sometimes a diver may hear from below the haunting "ping" of a submarine calling its shore station. The submarines are U.S. Navy war vessels, testing themselves against deep ocean conditions off Andros.

The ledge often is stark as the Painted Desert. Elsewhere, an outcropping of plate coral camouflages a giant sea bass. Swirls of tiny fish enact a strange ritual along some of these ledge-top reefs. Swarming like bees around a hive, they sweep and turn with military precision, puzzling the eye and disguising the sea bass' lair.

Tunnels lace Andros' reefs at depths of 40 to 60 feet. They intersect in the style of freeway ramps, sunlight dancing and shimmering through the broken roofs. Copper sweepers, thick as rain, thread among the light shafts and flash reflections like a spinning mirror.

Hole in the wall is a particularly large cave that has fascinated experienced divers from all over the world. This shaft goes straight back into the reef, its round opening frames the divers outside, suspended on a pane of deepest blue.

Uncounted blue holes dot the bights, or salt water creeks, the offshore reefs, and even the inland dry forests. Benjamin's Hole is one, named after film maker and explorer George Benjamin who discovered and explored it.

The Valley of the Sponges, located near Fresh Creek, harbors an incredible concentration of the large, distinctive sponges that are found everywhere around Andros. All shades of color, with many different textures, they provide a bright backdrop for dramatic photographs.

In Andros Town or Nicholls Town you can do a bit of scene-seeing if you're interested in native architecture, local folklore.

continued

DAVID DOUBILET

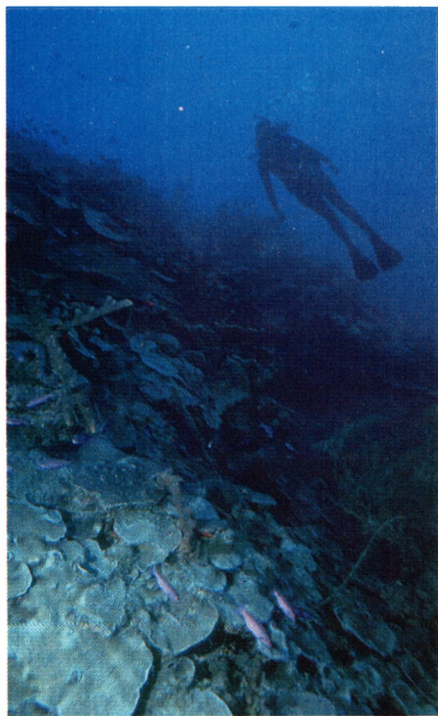
ANDROS

Andros is the Grand Canyon of Bahamian reefs. The region is remote, primitive and somewhat difficult to reach. The interior of the island is practically uninhabited, its wading birds stalk the marsh unmolested. The waters are still largely unexplored; touring the Andros reefs will put you in a marine wilderness of immense proportions.

The longest barrier reef in the Northern Hemisphere, and the third largest in the world, lies just off Andros' 120-mile eastern shore. It is wreathed in sunlit grottoes, elkhorn forests, arches, caves, giant coral heads and blue holes.

The reef tumbles down to the awesome Andros ledge. The ledge starts deep, in many places at more than 100 feet, then drops vertically into the Tongue of the Ocean, where the deep

RICHARD STEWART





ANDROS

GENERAL

Location: 170 miles southeast of Miami and 30 miles west of Nassau
 Size: 2300 square miles
 Topography: a flat island with sloping beaches
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 8,845
 Largest towns: San Andros, Nicholls Town, Andros Town, South Andros

DIVING

Water temperature: winter 75-85, summer 75-85 °F
 Visibility: 150 feet
 Depth of dives: 15-250 feet
 Currents: 0-½ knot
 Tidal fall: 3 feet
 Types of diving: wreck, wall, blue holes, drop-offs, coral gardens
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 4
 Diving craft: good
 Sights:
 Fish: groupers, snappers, tropical reef fish, grunts, jacks, porkfish, blue runners, blue marlin, moray eels, yellowtail, schoolmasters, trumpetfish
 Coral: fire coral, brain coral, stony coral, black coral, elkhorn and staghorn coral, pillar coral
 Sponges: seafans, seaweeds, tube sponges, cup sponges, basket sponges
 Shells: conch, murex, pecten, cypraea
 Invertebrates: jellyfish, anemones, nudibranchs
 Other: world's third largest barrier reef
 Restrictions: no spearfishing with scuba



DIVING SERVICES

Instruction available: resort course
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, BC, partial wet suit
 Equipment sales: none
 Equipment repair: fair
 Camera repair: none
 Air: to 2250 psi
 Guides: good

DIVERSIONS

Ground transportation: taxi
 Shopping: fair and reasonable
 Restaurants: none
 Nightlife: fair
 Other sports: wind surfing, ping pong, volleyball, sailing

JUST IN CASE...

Hospitals: 328-2038
 Police: 328-2626

PLANNING

Diving tours: Small Hope Bay Lodge, P.O. Box N-1131, Nassau, Bahamas
 Land tours: See your travel agent
 On your own: Bahamasair, 255 Alhambra Circle, Coral Gables, FL; Mackey International, Fort Lauderdale Airport, Fort Lauderdale, FL
 Airports: San Andros Airport (Northern Tip), Andros Town (Center of East Coast), Mangrove Cay (East), South Andros (Congo Town)
 Marinas: Andros Beach Hotel & Villas, Nicholls Town, P.O. Box 2856-AMF, Miami, FL 33169; Nicholls Town, San Andros Harbour, Mastic Point
 Accommodations: Las Palmas, South Andros, Congo Town, P.O. Box 800, South Andros, (809) (32) 82178; Small Hope Bay Lodge, Fresh Creek, Box N1131, Nassau—Ph: (809) (32) 82014; San Andros Hotel and Tennis Club; Andros Reef Inn, Stafford Creek

For information regarding languages, ethnic composition, economy, diving season, tourist season, recompression facilities, marine rescue, American Express, U.S. Consulate, Customs regulations, and a bibliography, refer to the specifications on page 69.
 Where a notation "fair," "good," or "excellent" appears after an item, such as guides or diving craft, it refers to the *availability* not the quality of the services.



BRUCE NYDEN

GRAND BAHAMA, WALKER'S CAY, WEST END



BRUCE NYDEN

Delicate serpulid worms (top) and other organisms attach themselves to Grand Bahamas' reefs. Around the former site of the Hydro Lab, some reef fish are tame enough to hand feed. Half an hour after the dive, you can be spinning the roulette wheel in El Casino, or bearing down on a first class steak and seafood dinner.

Gracious resorts, gambling, and diving come together on Grand Bahama. Lucaya has become an international tourist mecca, its hotels and famous El Casino a magnet for travellers. The International Bazaar offers shoppers bargains from every continent, and the ten-acre complex is a European maze of narrow, cobbled thoroughways lined with small establishments.

Lucaya is also home of the Underwater Explorer's Club, one of the oldest Bahamas diving resorts. The number of outstanding divers and diving photog-

raphers who have lived or worked here is a tribute to the sincerity with which its employees pursue their sport.

From any of Grand Bahamas' resorts, good diving is within easy reach. The cave or ledge area southwest of Bell Channel provides hours of fun, probing the narrow sand channels between rocky outcroppings. Shallower reefs, in ten to 15 feet, are covered with large stands of graceful elkhorn coral, the vertices of their spiralling arms a haven for squirrel fish and other small tropicals. Sea whips and gorgonians



RICHARD STEWART

wave with the slight surge, introducing beginners, who often are checked out here, to the undulating rhythm of the sea.

A short hike outside Freeport leads to Ben's Cave, an eerie, landlocked Blue Hole. Indian bones and artifacts were reportedly found among the underwater stalagmites by early explorers.

Fate blessed West End, Grand Bahama, with a special reef each for novice and veteran divers. Among coral habitats, Indian Cay Reef resembles a tropical rainforest. A shallow, easy dive of not more than 35 feet brings the diver within reach of a fertile playground of striped French grunts, grazing parrot fish and electric blue chromis. It is a reef to convince the beginner to become a knowledgeable veteran.

West End marina guides can take the veteran diver to Shark Reef, a bit deeper and farther offshore from Indian Cay. The gray-blue shapes that often glide by, lingering just at the edge of visibility, remind the diver of the species for which the reef was named.

Diving fever has invaded Walker's Cay, a luxurious retreat long reserved for big game fishermen. The island is at the top of the Bahamas Bank, nearly surrounded by the deep Atlantic. The geography has spawned a slightly different ecology from that usually found on Bahamian reefs.

Giant coral heads, 100 feet in diameter, provide close-packed living space for a metropolis of reef fish. Grouper sheltered in the cavernous recesses of these heads grow to a truly formidable



KATHY BENTLEY

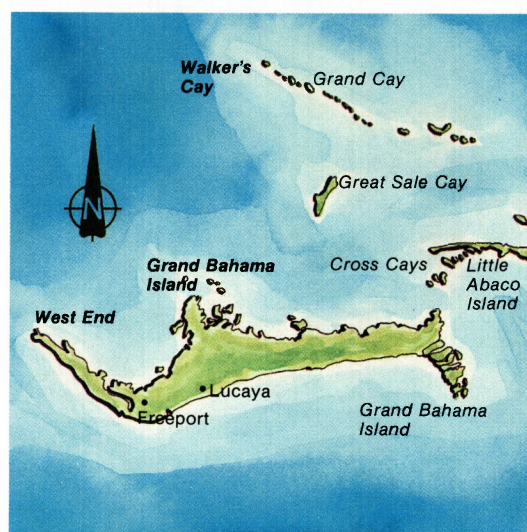
size. Hand feeding these monsters has become a favorite pastime of the local guides, and the opportunity to shake fins with a 150-pound Nassau shouldn't be passed up.

Porpoises and pelagic fish not seen further down on the Bank, such as mackerel and marlin, swim over the outer edges of the reef.

Large caves and undercuts honeycomb the wall; in some places the caverns are large enough to drive a truck through. The huge openings allow you to swim into the interior of the reef.

Freeport's International Bazaar is a showcase of duty free goods from around the world. Each section of the ten-acre complex carries the flavor of the countries whose goods are sold there—complete with authentic sidewalk cafes.

BAHAMAS DESTINATION DATA



GRAND BAHAMA/WEST END

GENERAL

Location: 70 miles east of West Palm Beach, Florida
 Size: 530 square miles
 Topography: a flat island with sloping beaches
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 25,000
 Largest towns: Freeport, West End

DIVING

Water temperature: winter 70-75°, summer 75-85° F
 Visibility: 110-120 feet
 Depth of dives: 15-250 feet
 Currents: 0-1/2 knot
 Tidal fall: 3 feet
 Types of diving: reef, wreck, wall, night, cave, drop-offs, coral gardens, blue hole
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 4
 Diving craft: excellent
 Sights: Fire, elkhorn coral; sponges; tropical reef fish

DIVING SERVICES

Instruction available: resort course, open-water certification, advanced open-water certification, underwater photography, instructor clinics
 Equipment rental: full line
 Equipment sales: full line
 Equipment repair: good
 Camera repair: none
 Air: to 3500 psi
 Guides: excellent

DIVERSIONS

Ground transportation: bus, taxi, rental car, motorbike, bicycle
 Shopping: excellent and reasonable
 Restaurants: excellent and reasonable
 Nightlife: good
 Other sports: tennis, golf, gambling, parasailing, water skiing, horseback riding

JUST IN CASE...

Hospitals: Freeport: Rand Memorial—352-6735; West End: Dial "operator"
 Diving doctors: John Clement—373-3333, Graham Barry—352-7288
 Police: Freeport: 352-8351; West End: Dial "operator"

PLANNING

Diving tours: Scubahamas, P.O. Box F-1261, Freeport, Grand Bahama;
 Underwater Explorers Society, P.O. Box F-2433, Freeport, Grand Bahama
 Land tours: See your travel agent
 On your own: Airlines—Mackey International, Ft. Lauderdale Airport, Ft. Lauderdale, FL; Shawnee, 3212 South Federal Highway, Fort Lauderdale, FL; Eastern, 4890 N.W. 36 St., Miami, Florida 33148; BWIA, 202 S.E. 1st St., Miami, FL; Bahamasair, 255 Alhambra Circle, Coral Gables, FL; Delta, 201 Alhambra Circle, Coral Gables, FL; International Air Bahamas, Miami
 Airports: Freeport International
 Marinas: Bell Channel Villas and Marina; Lucayan Beach Hotel and Marina; Lucayan Marina; Running Mon Marina; Blair House Hotel and Marina;
 Accommodations: See your travel agent

WALKER'S CAY

GENERAL

Location: 200 miles east of Miami and 75 miles north of Nassau
 Size: 126 square miles
 Topography: a flat island
 Climate: subtropical
 Population: 500
 Largest towns: Walker's Cay

DIVING

Water temperature: winter 75-85°, summer 75-85° F
 Visibility: 100-110 feet
 Depth of dives: 15-250 feet
 Currents: 0-1/2 knot
 Tidal fall: 3 feet
 Types of diving: reef, wreck, marine preserve, blue holes
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 2
 Diving craft: good
 Sights:
 Fish: groupers, snappers, tropical reef fish, various open water pelagic species, jacks, hatchetfish, coneys, squirrelfish, eagle rays, grunt, moray eels, angelfish
 Coral: fire coral, brain corals, stony corals, black corals, elkhorn, staghorn
 Sponges: seafans, seawhips, tube sponges, cup sponges

DIVING SERVICES

Instruction available: resort course
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment sales: none
 Equipment repair: none
 Camera repair: none
 Air: to 2250 psi
 Guides: good

DIVERSIONS

Ground transportation: taxi
 Shopping: none
 Restaurants: none
 Nightlife: none
 Other sports: bone fishing and deep sea fishing excursions
 Don't Miss: sunken Spanish galleon

JUST IN CASE...

Hospitals: Dial "operator"
 Police: Dial "operator"

PLANNING

Diving tours: Walker's Cay Hotel & Marina, 700 S.W. 34th St., Ft. Lauderdale, FL 33315
 Land tours: See your travel agent
 On your own: Private Charter—Walker's Cay Hotel & Marina
 Airports: Private Airstrip
 Marinas: Walker's Cay Hotel & Marina,
 Accommodations: Walker's Cay Hotel & Marina

For information regarding languages, ethnic composition, economy, diving season, tourist season, recompression facilities, marine rescue, American Express, U.S. Consulate, Customs regulations, and a bibliography, refer to the specifications on page 69.
 Where a notation "fair," "good," or "excellent" appears after an item, such as guides or diving craft, it refers to the *availability* not the quality of the services.

Dream Diving in the Caribbean.

The crystal clear waters of the Caribbean beckon to divers the world over. Divers who dream of reefs with an amazing array of undersea life.

Now National has put together "Dream Diving Vacations" to make every diver's dream come true. (Prices shown are per person and based on double occupancy. Airfare not included.) Are you ready? Get set. Dive!

The Current Club, North Eleuthera, The Bahamas

The Bahamas, so close and yet the out islands still have the peace and seclusion worthy of a tropical paradise. Enjoy water sports — snorkeling, water skiing, bottom fishing and the best of Bahama diving. Includes 7 days of diving with boat and guide. Three meals daily. Private cottage accommodations. \$360 (through 4/15/79).

The Seven Mile Beach, The Caymans

Gets its name from the white sand beaches that seem to go on forever. Renowned diver Bob Soto and his expert crew will show you the finest dive sites among the reefs of Grand Cayman. Includes 7 nights of accommodations, 6 days of diving by boat with guide (two tanks per day). From \$316 (through 4/15/79).

Bob Soto's Lodge, The Caymans

This lodge was built especially for divers by divers. Unsurpassed diving on live coral barrier reef that is close offshore. 7 nights accommodations. Breakfast and dinner daily. 7 days of diving by boat with guide (two tanks per day). \$287 (through 4/15/79).

Tortuga Club, The Caymans

The only hotel located on the cool windward coast of Grand Cayman Island. Dive the east end and see The Underwater Castle and the famous Wreck of the Ten Sails. Includes 7 nights of accommodations. Breakfast and dinner daily. Diving every day (two tanks per day). Free use of snorkeling equipment, sunfish. Tennis, water skiing. \$574 (through 4/15/79).

Marina Cay, British Virgin Islands

A jewel in the unspoiled British Virgin Islands. Within yards of shore discover the wonderful world of the reef, dive the wreck of the Rhone. The entire island is your hotel, with A-frame cottages along the beach. 6 days of unlimited diving (two tanks per day). All meals and wine included with dinner. \$472 (through 4/15/79).

Aquaventure with Captain Don Stewart, Bonaire

This Dutch island is famous for its magnificent flocks of pink flamingos, the incredible Salt Flats that change colors throughout the day and super diving. Numerous coral reefs, tropical fish and virgin dive sites. 7 nights accommodations. 6 days of unlimited diving. Breakfast daily, 5 dinners. \$248 (through 4/15/79).

The Reef House Resort, Roatan, Honduras

Intimate, tropical hideaway. Fronting directly on the reef protected Caribbean against a background of verdant, lush hills. You'll find more than 700 varieties of exotically colored small reef fish practically at your doorstep. 7 nights accommodations. 7 days of diving by boat (two tanks per day). Breakfast and dinner daily. \$308 (through 5/31/79).

For complete information send coupon to: Manager of Sports Sales, National Airlines, P.O. Box 592055/AMF, Miami, Florida 33159.

Name

Address

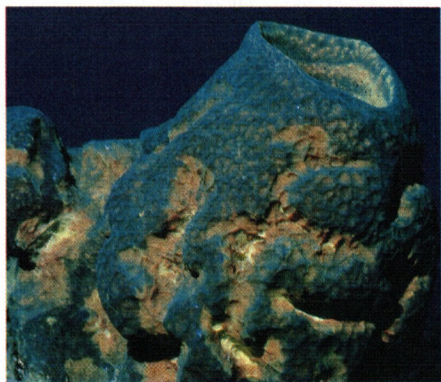
City/State/Zip

My travel agent is

National Airlines



DAVE WOODWARD



DAVE WOODWARD



The San Salvador Wall (upper left) rates high among the most impressive dives in the Bahamas. Typical water clarity is very good, offering divers a view of acres of lush reef growth. The sponges (left) are variegated and almost uniformly unique in form.

SAN SALVADOR, CAT ISLAND

Historians debate whether Columbus landed on San Salvador or Cat Island. The stubby finger of land now called Cat Island, that extends down the open Atlantic from Eleuthera to Long Island, long was known as St. Salvador. Moreover, an early explorer might well have found "Indians" on Cat Island's shores. Anthropologists have found Arawak relics among Cat's rocky hills.

Until very recently, Cat and San Salvador islands remained an upland explorer's paradise. The New World Museum in San Salvador's Cockburn Town and Watling's Castle at the island's southern end provide hours of after-dive enjoyment. Weed-grown sugar plantations, built by loyalists who fled the American revolution, lace Cat Island with their silent tales of failure and ruin.

Now, the two islands are a divers' discovery, accessible by out island commuter flight. It is an underwater region of steep walls and friendly fish. Sandy Point, at the southeast tip of the island, is said to offer the most consistent diving.

The probing isthmus of land shelters scattered brain coral heads in 35 feet of water. Grouper roam the terraced shallows down to the dropoff. Resort guides feed the fish to encourage their natural curiosity. Ubiquitous Nassau grouper follow divers like puppy dogs. Tiger and red grouper and yellow tail hang a little farther back.

The San Salvador wall slopes away at a 75 degree angle. Tube and basket sponges grace the precipice. Deep water gorgonians twist upward from their roots, reaching for the sunlight.

The upwellings from deep Atlantic waters trigger prolific reef growths along the windward walls of both islands. But the outside reefs are difficult to dive in most conditions. When a blow sets in, the leeward side offers patchreefs to explore.

A submerged mountaintop reaches within 45 feet of the surface at the south end of Cat Island. The southern tip is one of the two most consistently diveable reefs. The mountaintop teems

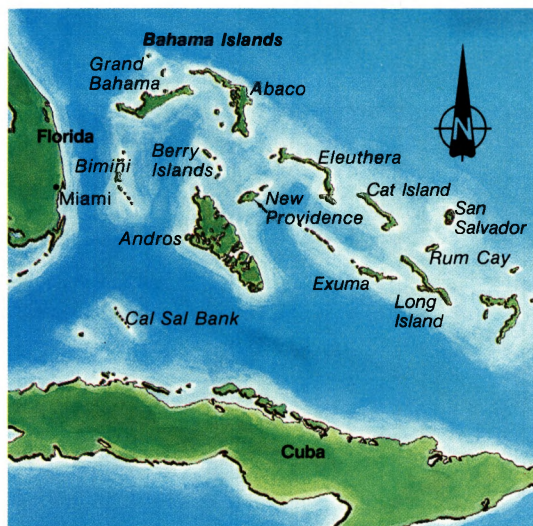
with all manner of fish, including predators. Sharks often restlessly patrol around the pinnacle.

Lobster populate the shallow reefs on the northern, leeward side of Cat Island's southern tip. Snorkelers from Hawks Nest chase the critters by the hour. Swarms of schooling fish enshroud the reefs a bit farther offshore, in 30 to 40 foot depths.

Few divers have seen the forests of coral heads that proliferate in the lee waters near Arthur's Town on Cat's northern tip. The star and brain coral formations often reach from the sandy floor almost to the surface, 45 feet above. Sea whips and fans clothe the sides of the heads. Fused staghorn gardens and heavy leaf corals decorate the tops. Caverns and ledges, cut through the heads by tidal surges, shelter sponges and fungi of delicate hues. Startled snapper and angelfish back warily inside the hollow heads. But most are unused to humans, and they soon venture within camera range.



RICK FREHSEE



SAN SALVADOR

GENERAL

Location: 200 miles southeast of Nassau
 Size: 60 square miles
 Topography: a hilly island
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 4,000
 Largest towns: Cockburn Town

DIVING

Water temperature: winter 75-85°, summer 75-85°F
 Visibility: 120-130 feet
 Depth of dives: 15-250 feet
 Currents: 0-½ knot
 Tidal fall: 3 feet
 Types of diving: reef, wreck, night, Drop-offs, Coral heads, Coral Gardens
 Skill level: novice, intermediate, advanced hazardous
 Dives per day: 3
 Diving craft: good
 Sights:
 Fish: groupers, snappers, tropical reef fish, grunt, squirrelfish, barracuda, eagle rays, slipper lobster, yellowspotted stingrays, moray eels
 Coral: fire coral, brain corals, stony corals, black corals, hard corals
 Sponges: seafans, seawhips, tube sponges, cup sponges, barrel sponges,
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course, underwater photography
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment sales: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment repair: good
 Camera repair: good
 Air: to 2250 psi
 Guides: good

DIVERSIONS

Ground transportation: taxi
 Shopping: fair and reasonable
 Restaurants: fair and reasonable
 Nightlife: fair

JUST IN CASE...

Hospitals: Dial "operator"
 Police: Dial "operator"

PLANNING

Diving tours: Columbus Landings, P.O. Box 1492, Ft. Lauderdale, Florida 33302
 Land tours: See your travel agent
 On your own: Airlines—Bahamasair, 255 Alhambra Circle, Coral Gables, Florida
 Airports: San Salvador
 Marinas: none
 Accommodations: Riding Rock Inn—Box 1492, Fort Lauderdale, FL 33302 (305) 566-7441

For information regarding languages, ethnic composition, economy, diving season, tourist season, recompression facilities, marine rescue, American Express, U.S. Consulate, Customs regulations, and a bibliography, refer to the specifications on page 69.

Where a notation "fair," "good," or "excellent" appears after an item, such as guides or diving craft, it refers to the *availability* not the quality of the services.



CAT ISLAND

GENERAL

Location: 130 miles southeast of Nassau and 325 miles southeast of Miami
 Size: 150 square miles
 Topography: hilly island
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 2,657
 Largest towns: Arthur's Town, The Bight, The Cove

DIVING

Water temperature: winter 75-85, summer 75-85 °F
 Visibility: 130-140
 Depth of dives: 15-250 feet
 Currents: 0-½ knot
 Tidal fall: 3 feet
 Types of diving: reef, drop-offs, coral gardens
 Skill level: novice, intermediate, advanced
 Dives per day: 2
 Diving craft: good
 Sights:
 Fish: grouper, snapper, tropical reef fish, amberjack, Bermuda chub, hogfish, nurse shark, kingfish, dolphinfish, hawksbill turtles, goatfish, blue runners, anchovies
 Coral: fire coral, brain corals, stony corals, black corals, elkhorn, staghorn, lettuce, gorgonians, pillar
 Sponges: seafans, seawhips, tube sponges, cup sponges, basket sponges
 Shells: conch, cypraea, murex
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment sales: none
 Equipment repair: fair
 Camera repair: none
 Air: to 2250 psi
 Guides: good

DIVERSIONS

Ground transportation: taxi
 Shopping: fair and inexpensive
 Restaurants: fair and reasonable
 Nightlife: fair
 Other sports: sailing, sportfishing

JUST IN CASE...

Hospitals: Dial "operator"
 Police: Dial "operator"

PLANNING

Diving tours: Cat Island Divers Ltd, P.O. Box 5122, Fort Lauderdale, FL 33310
 Land tours: See your travel agent
 On your own: Bahamasair, 255 Alhambra Circle, Coral Gables, Florida
 Airports: Arthur's Town
 Marinas: Bennett's Harbour—South of Arthur's Town; Hawk's Nest Creek—
 Accommodations: Cutlass Bay Club—Ph: The Bight; Fernandez Bay Club—

ABACO, TREASURE CAY



BOB WARNER

There is treasure near Treasure Cay and along the rest of the Abacos. The riches are not gold, but a reef as sculptured as some Grecian ruin. Between Abaco's white beaches and Europe lies only the broad Atlantic. The ocean swells crest, break and tumble across this ancient, still-living barrier.

Skiff captains from Treasure Cay, and divemasters from Marsh Harbor, prefer to guide tourists to protected patch reefs. Only in the calmest weather is it safe to anchor over the barrier reef. During any heavy wind, the approach is exceedingly hazardous. When moderate seas send paced rollers across the reef, divers may maneuver from inside the reef through cuts in the reef top to the depths just yards beyond.

Then the bottom drops abruptly down a craggy wall 60 feet to a sand floor. Spires and hollow coral mounds, surge-cut in the assaults and retreats of the sea, tower upward from the sand. Pillars loom through the plankton-laden water like armored statues peering out of antiquity. Columns of ancient coral skeletons wear living helmets of leaf coral. Giant amberjack and barracuda patrol the ruins. Grouper peer out of cavernous doorways at the invaders.

There is nothing sad about this battle-scarred reef. It has a stateliness and aura all its own. When the sand stirs from the bottom and the water temporarily clouds, it haunts the memory like a forest of giant oaks, encompassed by a dreamy fog.



RICHARD STEWART



RICHARD STEWART

The craggy, wave-sculpted reefs of Abaco harbor huge populations of tropical fishes. Sheltering from the force of the open Atlantic just east of their coral fortress, most are unafraid when approached by divers.



ABACO/TREASURE CAY

GENERAL

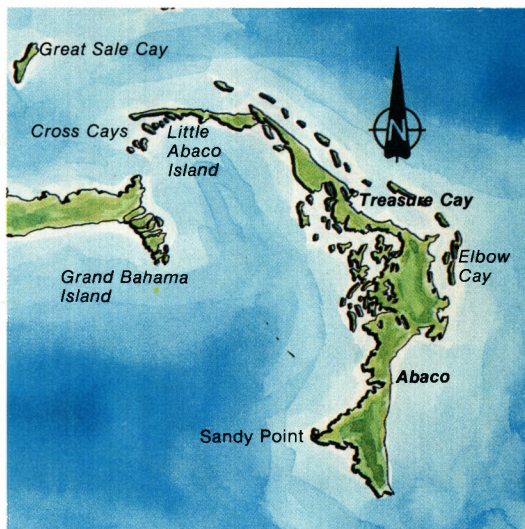
Location: 200 miles east of Miami and 75 miles north of Nassau
 Size: 650 square miles
 Topography: a flat island
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 6,000
 Largest towns: Treasure Cay, Marsh Harbour

DIVING

Water temperature: winter 75-85, summer 75-85 °F
 Visibility: 100-110 feet
 Depth of dives: 15-250 feet
 Currents: vary
 Tidal fall: 3 feet
 Types of diving: reef, wreck, marine preserve, blue holes
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 2
 Diving craft: good
 Sights:
 Fish: groupers, snappers, tropical reef fish, jacks, hatchetfish, coney, squirrelfish, eagle rays, grunt, moray eels, angelfish
 Coral: fire coral, brain coral, stony coral, black coral, elkhorn, staghorn
 Sponges: sea fans, seaweeds, tube sponges, cup sponges
 Shells: cypraea, murex, conch
 Invertebrates: nudibranchs, serpulids
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
 Equipment sales: mask, fins, snorkel, weight belt, weight, tank, regulator, safety vest, BC
 Equipment repair: fair
 Camera repair: none
 Air: to 2250 psi
 Guides: good



DIVERSIONS

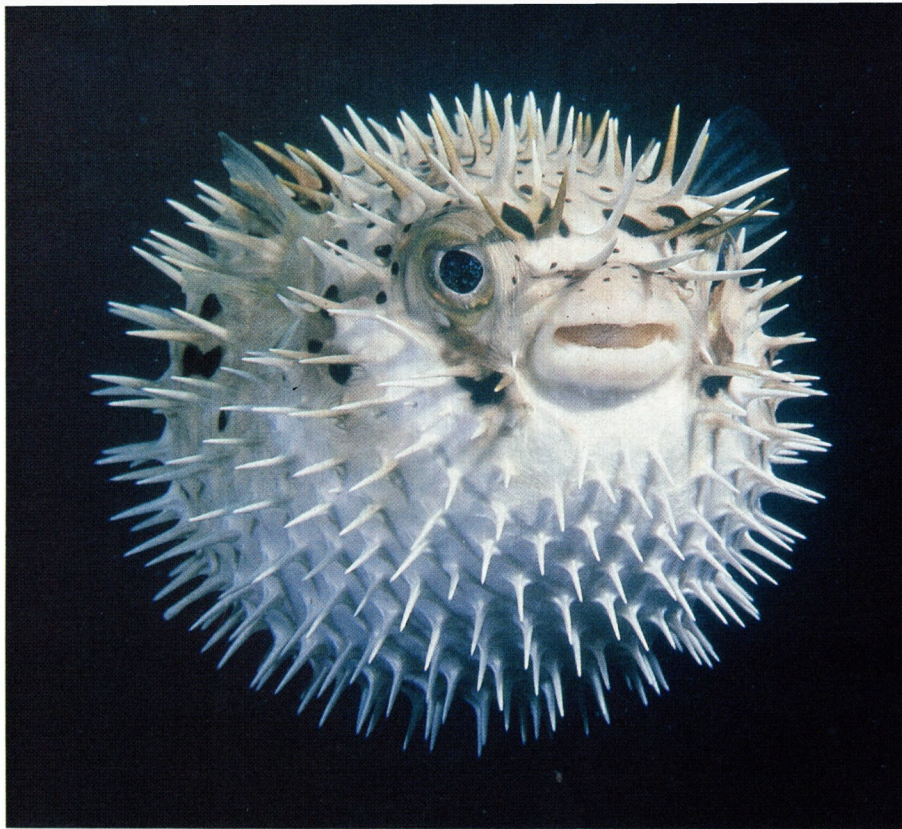
Ground transportation: taxi
 Shopping: fair and reasonable
 Restaurants: good and reasonable
 Nightlife: fair
 Other sports: sportfishing, golf, tennis

JUST IN CASE...

Hospitals: 367-2320
 Police: 367-2560

PLANNING

Diving tours: Dave Gale's Island Marine, Hopetown, Abaco, Bahamas;
 Chambered Nautilus, P.O. Box 434, Marsh Harbour, Abaco, Bahamas
 Land tours: See your travel agent
 On your own: Airlines—Shawnee Airlines, 3212 South Federal Highway, Ft. Lauderdale, FL; Bahamasair, 255 Alhambra Circle, Coral Gables, FL; Mackey International, Ft. Lauderdale Airport, Ft. Lauderdale, FL
 Airports: Treasure Cay Airport, Marsh Harbour International
 Marinas: Hope Town Harbour Lodge—Ph: Hopetown, Box 3941 Mia, FL 33101 (305) 444-8381; Man-O-War Cay Harbour; Marsh Harbour—Ph: 72022; White Sound Harbour—(301) 772-0812
 Accommodations: Green Turtle Club—Ph: 367-2572; Guana Harbour Club—Ph: Marsh Harbour; Hopetown Harbour Lodge—Ph: Hopetown; Treasure Cay Beach Hotel—Ph: (305) 444-8381; Mariner's Cove; Abaco Inn, Hopetown—(809) 367-2666; Bluff House; Conch Inn; Box 434, Marsh Harbour—Ph: 2800, 2233; Elbow Cay Club, Hopetown—(800) 327-0787



RICHARD STEWART

Nassau, capital of the Bahamas, bustles with commerce and politics, tour ships and jetliners. With a population of over 100,000, it contains nearly 60 percent of the entire native population of the Bahamas. The ancient homes along East Bay street are clustered thickly, and are typically British in character, testimony to the nationality of early settlers.

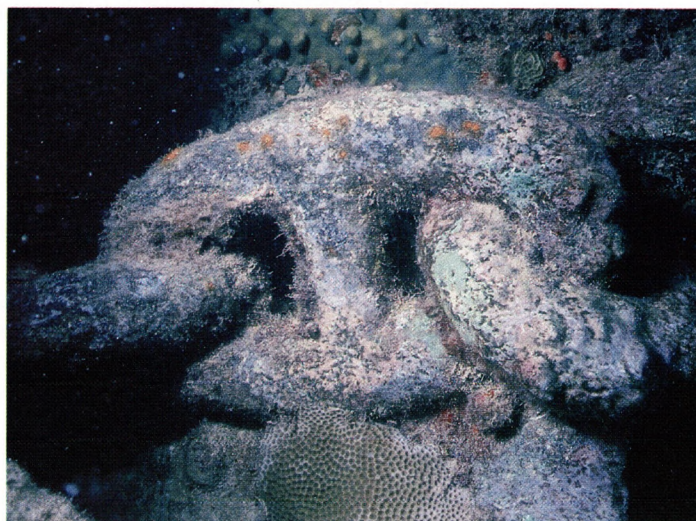
Aside from the numerous hotels and the casinos of Paradise Island, there are the Bahamia Museum and Blackbeard's Tower. This ruin is said to have been used by the pirate Blackbeard and crowns a small seaside hill.

Due to its international influence and the fact that most out island resorts are within 150 miles of New Providence thousands of tourists pass through Nassau every year. Unfortunately, most are unaware of the excellent diving that exists just offshore.

Bigger fish have fled most, but not all, of Nassau's reefs. Green Cay reef's dream-like formations, built of pillar and brain coral, are nearly deserted beyond the 50-foot depths. But the elkhorn-topped heads lying in shallower water just a bit closer to the cay teem with angels and spadefish.

Two luckless vessels trying to negotiate the shoals around Nassau harbor in storms created the island's best-known wreck dives. The *Mahoney*, a small steamer, lies on sand in 30 feet of water. A sunken LCT, a backdrop for the movie "Thunderball," sits in water shallow enough for snorkelers to tour. It is surrounded by shallow coral.

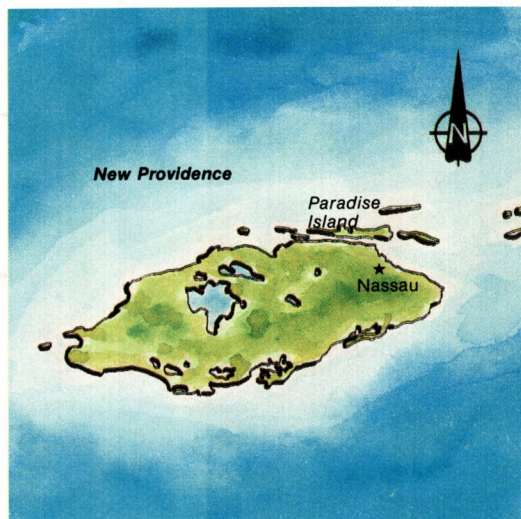
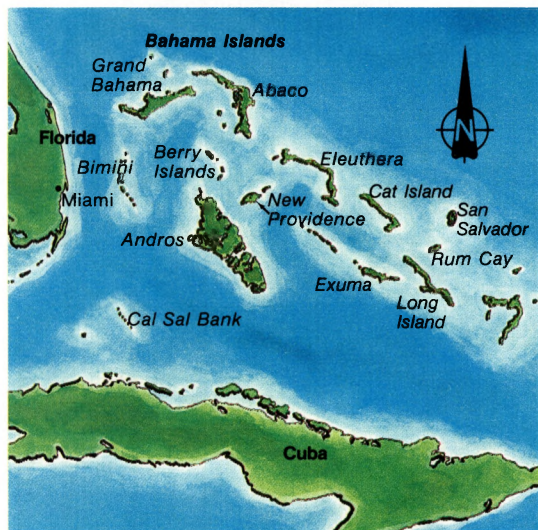
The Nassau ledges begin in deep water. The Lyford Cay Wall is locally famous for its sponges, black coral and fish-filled caves. It begins at 100 feet. The neighboring Lambton Wall boasts even more dramatic topography, but fewer fish. The wall of Gambier is more of a slope. It is saturated with fish and small coral heads.



BOB WARNER

NEW PROVIDENCE

*Exciting night life is available above and below water on New Providence. The nocturnal marine species around the island compete with the brightest and most colorful of Nassau's night spots. Many divers pass through Nassau as they change planes for the out islands, but most do not use the opportunity to explore the island's offshore attractions. Layovers here can be arranged to get in just the right amounts of gambling and scuba. Chains from the *Mahoney* (above), a sunken vessel outside of Nassau harbor, are encased by coral growth.*



NEW PROVIDENCE

GENERAL

Location: 170 miles east of Miami
 Size: 58 square miles
 Topography: a hilly island with sloping beaches
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 102,000
 Largest towns: capital: Nassau

DIVING

Water temperature: winter 75-85, summer 75-85 °F
 Visibility: 70-80 feet
 Depth of dives: 15-250 feet
 Currents: 0-1/2 knot
 Tidal fall: 3 feet
 Types of diving: reef, wreck, drift, drop-offs, coral gardens, blue hole
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 2
 Diving craft: good
 Sights:
 Fish: groupers, snappers, tropical reef fish, triggerfish, parrotfish, trumpetfish, blue tang, grunt, queen triggerfish
 Coral: fire coral, brain coral, stony coral, black coral, wire, elkhorn
 Sponges: sea fans, seaweeds, tube sponges, cup sponges
 Invertebrates: banded coral shrimp, arrowcrabs, lobster, octopus, cleaner shrimp
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course, open-water certification, advanced open-water certification, instructor clinics
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack
 Equipment sales: mask, fins, snorkel, weight belt, weight, tank
 Equipment repair: fair
 Camera repair: none
 Air: to 5000 psi
 Guides: excellent

DIVERSIONS

Ground transportation: taxi, rental car, motorbike
 Shopping: excellent and reasonable
 Restaurants: excellent and reasonable to expensive
 Nightlife: excellent
 Other sports: golf, parasailing, tennis
 Don't miss: Casino, Blackbeard's Tower

JUST IN CASE...

Hospitals: Princess Margaret Hospital—322-2861
 Police: 322-4444

PLANNING

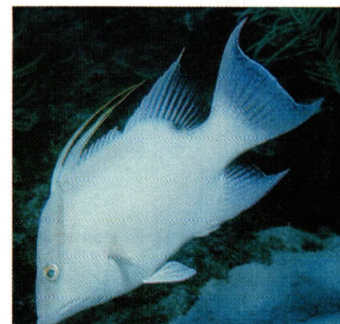
Diving tours: Bahama Diver's Ltd., P.O. Box 5004, Nassau, Bahamas;
 Underwater Tours Ltd, P.O. Box 5693, Nassau, Bahamas; Arawak Tours,
 P.O. Box N-7816, Nassau Village, Nassau, Bahamas
 Land tours: See your travel agent
 On your own: Airlines—Air Florida 3900 N.W. 79 Avenue, Miami, FL; Bahamasair 255
 Alhambra Circle, Coral Gables, FL; Chalk's, MacArthur Cswy, Miami Beach, FL;
 Eastern 4890 N.W. 36 St, Miami, FL 33148; Air Jamaica 100 Biscayne Blvd
 North Miami, FL 33132; Delta 201 Alhambra Circle, Coral Gables, FL
 Airports: Nassau International
 Marinas: Mermaid Marina, ph: 52876; East Bay Yacht Basin, ph: 23754; Nassau
 Yacht Haven, ph: 28173; Bayshore Marina, ph: 28232; Brown's Boat Basin,
 ph: 31231; Nassau Harbour Club, ph: 31771; Hurricane Hole Marina,
 ph: 55441
 Accommodations: See your travel agent



RICK FREHSEE

Hawksbill turtles (above) are frequent visitors to Long Island. The currents that sweep through the numerous cuts bring nourishment to gorgonians (bottom) and provide divers an undersea amusement ride, bobbing over the bottom at speeds to six knots.

EXUMA, LONG ISLAND



STEPHEN FRINK

Hundreds of diving newcomers learned the sport in the shallow reefs off Long Island, and the place isn't worn out yet. It isn't likely to suffer from divers because the instructors and divemasters of Stella Maris encourage comradeship among divers and the nations of grouper that populate the reefs.

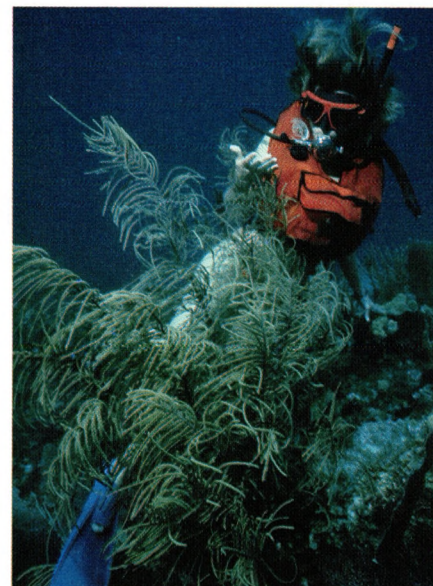
"The groupers have gotten downright pugnacious about getting their share when divers feed them," says longtime charter-boat skipper Skeet LaChance.

The government forbids molesting any live creatures along the 22-mile National Land and Sea Park at the north end of the Exumas. Snorkelers find the park shallow and glittering with coral gardens, its fish both varied and bold; un-

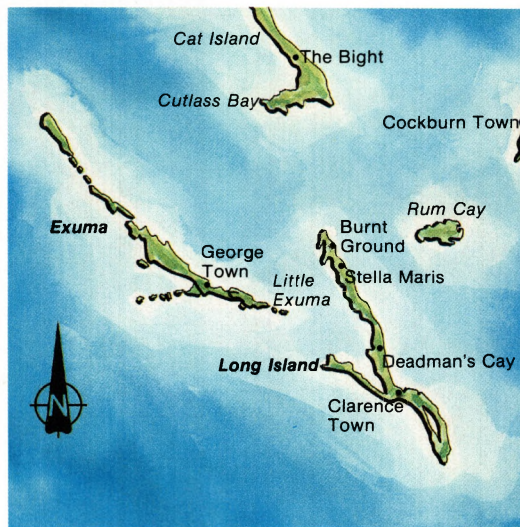
afraid of the human visitors.

The entrance to the cave at Stocking Island, directly across from the community of George Town is an exciting trip. Three feet beneath the surface, 20 feet by 12 feet, the entrance leads to a tunnel that exhibits tidal flow and holds a myriad of marine life. George Town is the site of the oldest sailboat regattas in the Western Hemisphere. The race, held each spring, attracts hundreds of Bahamian workboats. The island becomes jammed with sailors and spectators, and the carnival atmosphere is almost electric.

The cuts between the various cays that make up the Exumas, and the walls surrounding nearby Concepcion Island are all diveable from Great Exuma.



RICHARD STEWART



EXUMA

GENERAL

Location: 35 miles southeast of Nassau
Size: 130 square miles
Topography: a flat island with sloping beaches
Climate: subtropical with 40-60 inches of precipitation annually
Population: 4,500
Largest towns: Georgetown, Rolleville, Steventon, Rolletown

DIVING

Water temperature: winter 75-85°, summer 75-85° F
Visibility: 110-120 feet
Depth of dives: 15-250 feet
Currents: 0-½ knot
Tidal fall: 3 feet
Types of diving: reef, night, drift, beach, drop-off, coral gardens, blue hole
Skill level: novice, intermediate, advanced, hazardous
Dives per day: 2
Diving craft: good
Sights:
Fish: groupers, snappers, tropical reef fish, eagle rays, amberjacks, horse-eye jacks, turtles, queen angelfish, stingrays, grunt, squirrelfish,
Coral: fire coral, brain corals, stony corals, black corals, star coral, gorgonians,
Sponges: seafans, seawhips, tube sponges, cup sponges,

DIVING SERVICES

Instruction available: resort course, open-water certification, advanced open-water certification
Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
Equipment sales: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
Equipment repair: fair
Camera repair: none
Air: to 3000 psi
Guides: good

DIVERSIONS

Ground transportation: taxi
Shopping: fair and reasonable
Restaurants: good and reasonable
Nightlife: fair
Other sports: waterskiing, fishing, tennis, boating

JUST IN CASE...

Hospitals: 326-2666 Police: 326-2666

PLANNING

Diving tours: Staniel Cay Yacht Club, 1760 S.W. 67th Avenue, Plantation, Florida, 33317; Exuma Divers Company, P.O. Box 152, Georgetown, Exuma, Bahamas
Land tours: See your travel agent
On your own: Airlines—Bahamasair, 255 Alhambra Circle, Coral Gables, Florida; Airports: Georgetown
Marinas: Highborne Cay, Staniel Cay—Ph: 33-42090, George Town, Great Exuma, Sampson Cay, Norman's Cay Box N624 Nassau
Accommodations: Norman's Cay Club, Box N624, Nassau; Out Island Inn; Peace & Plenty Club, Box 55, George Town (809) (33) 62554

LONG ISLAND

GENERAL

Location: 160 miles southeast of Nassau
Size: 230 square miles
Topography: hilly with seaside cliffs
Climate: subtropical with 40-60 inches of precipitation annually
Population: 4,000
Largest towns: Clarence Town

DIVING

Water temperature: winter 75-85°, summer 75-85° F
Visibility: 120-130 feet
Depth of dives: 15-250 feet
Currents: 0-½ knot
Tidal fall: 3 feet
Types of diving: reef, wreck, night, drop-offs, coral head, beach dives
Skill level: novice, intermediate, advanced, hazardous
Dives per day: 3
Diving craft: good
Sights:
Fish: groupers, snappers, tropical reef fish, parrotfish, nurse sharks, blacktips, stingrays, tuna, horse-eye jack, angelfish, barracuda, amberjack
Coral: fire coral, brain coral, stony coral, black coral, gorgonians, elkhorn coral
Sponges: seafans, seawhips, tube sponges, cup sponges
Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: resort course
Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC
Equipment sales: mask, fins, snorkel
Equipment repair: fair
Camera repair: none
Air: to 2250 psi
Guides: good

DIVERSIONS

Ground transportation: taxi
Shopping: fair and reasonable
Restaurants: fair and reasonable
Nightlife: fair
Other sports: water skiing, tennis, fishing
Don't Miss: Luminous limestone caves

JUST IN CASE...

Hospitals: Dial "operator"
Police: Clarence Town—dial "operator," ask for extension 231; Deadman's Cay—extension 232; Sims—extension 233

PLANNING

Diving tours: Stella Maris Inn, P.O. Box 105, Stella Maris Post Office, Long Island, Bahamas
Land tours: See your travel agent
On your own: Bahamasair, 255 Alhambra Circle, Coral Gables, Florida
Airports: Stella Maris (pvt); Deadman's Cay (pvt)
Marinas: Stella Maris
Accommodations: Stella Maris Inn, Cape Santa Maria Club

For information regarding languages, ethnic composition, economy, diving season, tourist season, recompression facilities, marine rescue, American Express, U.S. Consulate, Customs regulations, and a bibliography, refer to the specifications on page 69.
Where a notation "fair," "good," or "excellent" appears after an item, such as guides or diving craft, it refers to the *availability* not the quality of the services.



STEPHEN FRINK

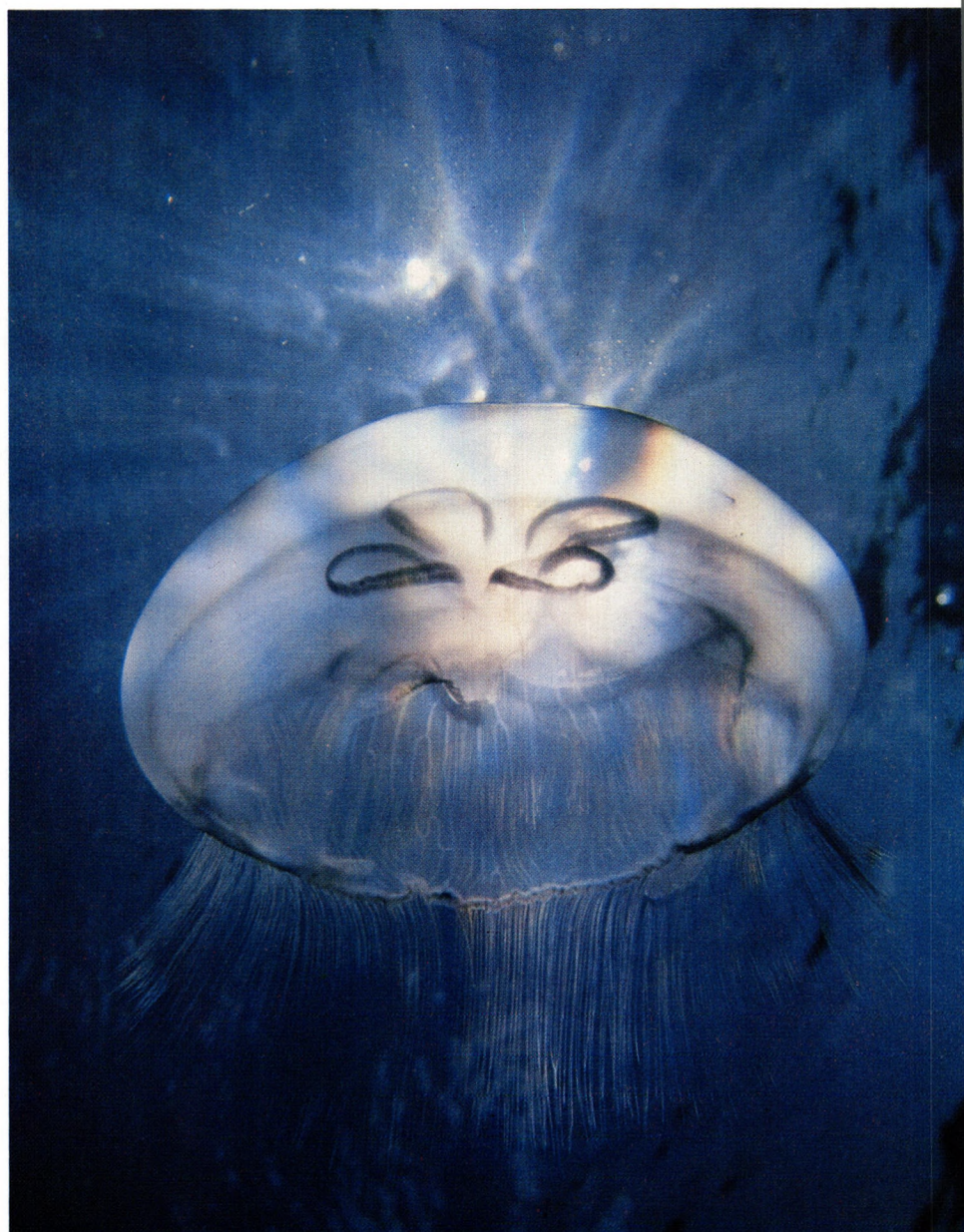
CAY SAL

Generations of Cuban fishermen knew the Cay Sal Banks as one of the most prolific fishing grounds in the subtropical Atlantic. They returned year after year. Exiled Cubans from Miami took lobster by the millions from the hundreds of square miles of banks and reefs. Still, each year, the lobster replenished themselves almost as heavily as before. The harvest continued until the Bahamian government shut down foreign fishing three years ago.

Now, Cay Sal is a fresh diving discovery. Perhaps the clouds of Cay Sal fish grew wary of the fishermen's baited hooks. But they appear unperturbed by divers. Cay Sal lacks nothing in the way of reefs. Its miles of banks and coral heads are fringed with long, terracing steps into deeper water and the Cay Sal wall. The wall almost surrounds the banks. It is deep, abrupt, and crowded with jewfish, horse-eye jack, ocean triggers and, often, shark. It rivals any wall in the Bahamas. The Cay Sal shelf even gives way to an occasional blue hole.

What Cay Sal does not have is on-shore accommodations of any kind. None. You can land a small plane—very carefully—on the little air strip, clear customs at the tiny government outpost, tour the abandoned lighthouse, and take off again. That's all there is.

Several Florida dive charter boats tour Cay Sal. Most of these are based in the Keys, offering divers the opportunity to see two great areas during a single vacation. The run to Cay Sal is about six hours from Key Largo, so plan to spend several days on board.

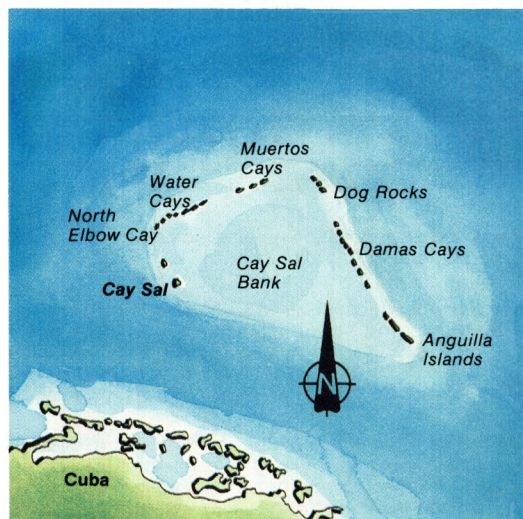


STEPHEN FRINK



RICHARD STEWART

Cay Sal is a bug hunter's paradise. The rocky islet has been known for its lobster population for years (below). Now intrepid divers harvest the tasty crustaceans, which have been even more plentiful since the Bahamas banned foreign fishing vessels from Cay Sal several years ago.



CAY SAL

GENERAL

Location: 140 miles south of Miami and 170 miles west of Andros
 Size: 2 square miles
 Topography: a flat island with rocky coastline
 Climate: subtropical with 40-60 inches of precipitation annually
 Population: 3
 Largest towns: Customs station

DIVING

Water temperature: winter 75-85°, summer 75-85° F
 Visibility: 120-130 feet
 Depth of dives: 15-250 feet
 Currents: vary
 Tidal fall: 3 feet
 Types of diving: reef, wall, night, cave
 Skill level: novice, intermediate, advanced
 Dives per day: 3
 Diving craft: excellent
 Sights:
 Fish: groupers, snappers, tropical reef fish
 Coral: fire coral, brain coral, stony coral, black coral
 Sponges: seafans, seawhips, tube sponges, cup sponges
 Restrictions: no spearfishing with scuba

DIVING SERVICES

Instruction available: none
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack
 Equipment sales: none
 Equipment repair: none
 Camera repair: none
 Air: to 2250 psi
 Guides: good

DIVERSIONS

Ground transportation: none
 Shopping: none
 Restaurants: none
 Nightlife: none
 Other sports: fishing
 Don't Miss: lighthouse

JUST IN CASE...

Hospitals: none
 Diving doctors: none
 Recompression facilities: One available chamber: Freeport, Grand Bahama
 Police: none

PLANNING

Diving tours: Sea Fever Diving Cruises, P.O. Box 1335, Key Largo, FL 33037;
 Sunshine Key Aqua Center, Rt 1, Box 790L, Sunshine Key, FL 33043;
 Underseas, Inc., P.O. Box 319, Big Pine Key, FL 33043
 Land tours: none
 On your own: Airlines—none
 Airports: Cay Sal Airstrip
 Marinas: none
 Accommodations: on board charters only

Some information regarding the Bahamas applies to all of the islands and is not repeated on the preceding specifications pages:

GENERAL

Language: English
 Ethnic composition: 87% Black, 13% mixed
 Economy: 20% agricultural, 5% industrial, 75% tourism
 Monetary unit: One Bahamian Dollar = \$1.00 US
 Diving season: all year
 Tourist season: mid-December to mid-April

JUST IN CASE...

Recompression facilities: There is one chamber available in the Bahamas. It is in Freeport, Grand Bahama at the Underwater Explorer's Society, PH: 373-2264, CH 16 VHF.
 Marine Rescue: Bahamas Air Sea Rescue Association (BASRA) CH 16 VHF; CH 11 CB; Unicom 122.8
 American Express: The only Amex representative in the Bahamas is: Play Tours, R.H. Curry and Company, Shirley Street, Nassau, Bahamas (809) 322-2931, 322-2937
 U.S. Consulate: American Embassy, Seymour Weiss, Queen Street Post Office Box N8197, Nassau (809) 322-1181

PLANNING

Campgrounds: Camping is not allowed in the Bahamas.
 Customs and Immigration: birth certificate, voter's registration card, or passport
 Import restrictions: trademark items, alcohol, arms, ammunition, and mechanical or pneumatic spearguns may not be brought into the Bahamas
 How much cash may you bring into the country? unlimited
 Export restrictions: no form of marine life collected in the Bahamas may be exported
 U.S. Customs re-entry restrictions: \$300 worth of goods and currency duty free
 Bibliography: Bahamas Diver's Guide—Shlomo Cohen; Islands of the Bahamas—Hans Hannau; Yachtsman's Guide to the Bahamas—Kline
 Spearfishing is allowed only with the Hawaiian sling, and only while free diving. Spearfishing of all types is prohibited in areas designated as land-and-sea parks.

RESORT GUIDE

RIDING ROCK INN— SAN SALVADOR ISLAND

Cockburn Town, San Salvador Island, Bahamas. Phone: 800-327-9473.

RESERVATIONS: Columbus Landings Travel Department, Post Office Box 1492, Ft. Lauderdale, Florida 33302. Phone: 800-327-9473 (except Florida/Canada 305-566-7441).

LOCATION—Secluded resort location on west side of island directly on the ocean, one-half mile north of Cockburn Town on San Salvador Island. One-quarter mile from San Salvador Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami to San Salvador, Columbus Landings Air from Ft. Lauderdale. Private flights can land at San Salvador Airport's 4500-ft lighted airstrip with ESE approach. Ground: transfer from airport included in rates and provided by the hotel. Car, boat, and motorcycle rentals available.

ACCOMMODATIONS—Twenty-four double rooms in the hotel have poolside or ocean view. Six cottage-style villas feature refrigerators and terraces. All guest rooms include private bath, shower, air conditioning, private patio. Resort has eighteen miles of sandy beach and all buildings are within walking distance of the marina and sport facilities. Complete resort facilities include dining room, large veranda. Driftwood Lounge with entertainment, freshwater swimming pool, tennis court and marina with six berths, five foot draft, fuel, ice, electricity, water. Airport is paved, call approach Unicom 122.8, LF BN frequency is 281 mc. Rates: single room for \$54 (Full American plan), double room for \$78 (Full American plan). Ocean-side cottages: single for \$67 (Full American plan), double for \$84 (Full American plan). Each additional person \$28. Children under eleven years \$23. Only Visa and MasterCard credit cards accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Ingersoll-Rand compressor, 5000 PSI. Two hundred and ten tanks, each seventy-two cubic feet. Four 34-foot tri-hull flat-top sun cover dive boats with a total capacity for seventy-two divers. Limited retail sales available. Rental equipment includes tank \$8/day, regulator \$7/day, mask/snorkel \$1/day, underwater light \$5/day, underwater camera \$25/day, flash \$10/day. Complete photography lab and workshop on site, includes air conditioned 1500 square foot building with individual workbenches, lights and storage. Classroom has ten by twelve foot protection screen and complete audio-visual equipment. Darkroom for E-6 processing has temperature controlled plumbing, water softening apparatus and special filters. Film in stock, twenty-four hour photo finishing available for \$6.50/strip, \$8.00/mounts.

DIVING SERVICES—PADI, NAUI, NASDS, SSI, YMCA affiliation. Five star PADI training facility. Six instructors and six divemasters. Resort course \$75, full certification \$160, advance courses \$50, photo coaching \$25, one day introduction to photography \$50, basic photo course \$100. First aid/CPR trained. Cost for one-half day diving \$22 includes two dives, cost for full day diving \$38 includes three dives, cost for night dive \$16. Tank/bacpac, weights included in dive. Dives are all pre-planned to insure maximum time underwater. Dive boats are one hundred and fifty yards from rooms. Dive sites are only five or ten minute boat ride from dock. Sites include Pillar Reef, Riding Rock Wall, Shark Alley, Cathedrals, Movie Caves, Cable Drop Off, Hamlet Holes and Grouper Gully.

DIVING PACKAGES—Eight days/seven nights for \$595/room per person, \$620/cottages per person. Includes three dives per day, for six days or eighteen dives. Round trip air between Ft. Lauderdale and San Salvador, three meals a day, accommodations, taxes, gratuities, orientation party, transfers between airport and Inn, sightseeing tour. Underwater photography course personally conducted by Paul J. Tzimoulis for \$849. Includes round trip air from Ft. Lauderdale to San Salvador, accommodations double occupancy, three meals a day, taxes, gratuities, transfers between airport and Inn, fourteen dives including tank/bac pac, weights, air, tuition for course, use of over \$50,000 worth of Nikonos underwater photography accessories including strobes, connectors, wide-angle and macro lenses, film processing for ten rolls of your Ektachrome 64 color film. Non-diver packages include tennis, sailing, water skiing, history tours, snorkeling, shelling and fishing. Tank refills not sold to public. Unattended diving, spearfishing, collection of fish or marine life prohibited. Because of limited space, ninety day advance reservations are suggested. Return attached post cards for more information.

DIVE SAN SALVADOR

—IN THE SUN BLESSED BAHAMAS—

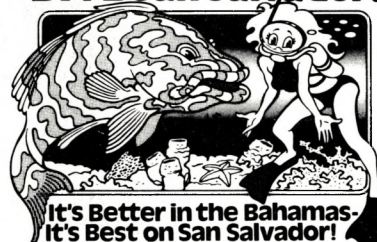
DIVING FUN FOR THE ENTIRE FAMILY

VARIOUS COURSES TO ADVANCE YOUR SKILLS IN DIVING AND UNDERWATER PHOTOGRAPHY

20 miles of virgin reefs—short boat trips
Daily diving in crystal, warm water
Direct flights from Ft. Lauderdale
Finest U/W photo center in all of diveland
Plenty to do for non-diving companions



DIVE San Salvador!



RESORT GUIDE

ADVENTURE CRUISES— BAHAMA ISLANDS

Fort Lauderdale, Florida. Phone: 305-742-4045.

RESERVATIONS: Adventure Cruises, c/o Captain Gary Smith, Post Office Box 22284-S, Fort Lauderdale, Florida 33335. Telephone: 305-742-4045.

LOCATION—Dive boat, docked at marina in Ft. Lauderdale, cruises to Bimini, Freeport, Berry Island, Nassau, Andros, and Exumas. Located off Route 84 ¼ mile from Interstate 95. Two miles from Ft. Lauderdale Airport.

TRANSPORTATION—Air: Eastern, Air Florida and Southern to Ft. Lauderdale. Private plane facilities at Ft. Lauderdale Airport. Ground: taxi from airport to dive boat \$6. Access routes: located on Route A1A, accessible from Interstate 95.

ACCOMMODATIONS—Highlander IV, a 60-ft. cruiser designed and skippered by divers, is equipped with full galley, stereo, air conditioning, carpeting, air compressor, hot/cold water and two private heads and showers. Three double staterooms and one four-person suite can sleep ten divers. Powered by twin diesel engines, with air compressor, Zodiac chase boat, auto-pilot, depthfinder, S.S.B. and auxiliary generator. Master Charge and Visa credit cards are accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

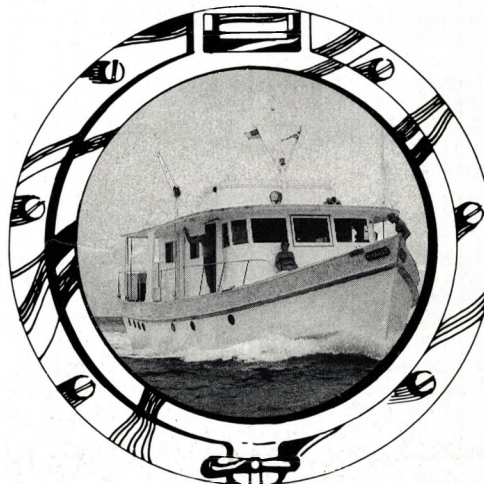
DIVING EQUIPMENT—Mako compressor, 3000 PSI. 18 72-cu/ft tanks. Cruiser has a 16-ft. chase boat with a total capacity for 10 divers. No retail sales. Tanks and wt. belts included in dive rates. Regulators \$6/day, mask \$1.50/day, fins \$1.50/day, snorkel \$1.50. Film on stock, no camera rental.

DIVING SERVICES—PADI, NAUI affiliation. 1 instructor and 3 dive masters, first aid/CPR trained. Resort course \$35. No half-day or full-day dives available.

DIVING PACKAGES—10 days for \$621 per person, 7 days for \$435 per person, 5 days for \$311 per person. Includes all meals, accommodations, air, unlimited diving, tanks, weights.

Adventure Cruises

DIVE BOAT HIGHLANDER IV



COMPLETE BAHAMA DIVING VACATIONS

BAHAMA DIVERS— NEW PROVIDENCE ISLAND

Box 5004, Nassau, New Providence, Bahamas. Phone: 809-322-8431.

RESERVATIONS: Bahama Divers, P.O. Box 5004, Nassau, New Providence, Bahamas. Hotel reservations: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Located in the center of Nassau overlooking Nassau Yacht Haven and the Harbour. 12 miles from Nassau International Airport.

TRANSPORTATION—Air: Air Florida from Ft. Lauderdale, Air Canada from Montreal and Toronto, Bahamasair from Ft. Lauderdale and Miami, Eastern from Atlanta, Miami and New York, Delta from New York. Ground: taxi from airport for \$8, car rentals available.

ACCOMMODATIONS—Over 2900 hotel rooms in the Nassau area offer accommodations ranging from deluxe full-service hotels to small cottages. Bahama Divers is located in the Pilot House Hotel, a small informal hotel with 125 air conditioned rooms and kitchenettes. Pilot House Hotel Rates: single for \$24-29 summer, \$29-38 winter (European plan); double for \$27-33 summer, \$35-42 winter (European plan). Amex and Master Charge credit cards accepted.

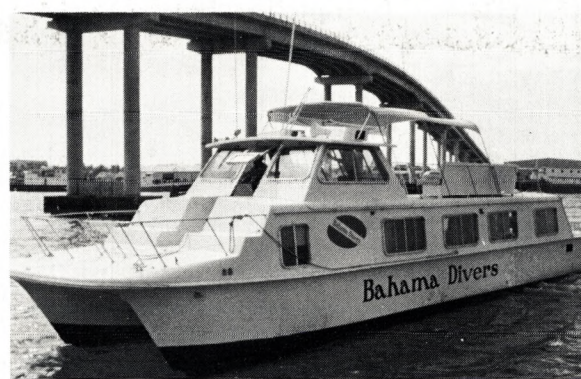
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Worthington compressor, 3000 PSI. 40 tanks. 2 dive boats include a 42-ft Custom and a 56-ft Carrycraft. Tank/bac pac, mask/snorkel, wt. belt/lead, regulator included in dive. No photo equipment available.

DIVING SERVICES—PADI affiliation. 1 instructor and 5 dive masters available. Resort course \$28. Full certification and advance diving courses also available. Cost/half-day diving \$25 for 1 dive: full day \$50 for 2 dives: night dive \$25.

DIVING PACKAGES—8 days/7 nights for \$373 single, \$295 double, \$266 triple occupancy. Includes accommodations, two meals per day, airport transfers, tax, gratuities, basic gear and 6 half-day dives. 10% reduction for divers with own regulator.



RESORT GUIDE

BIMINI UNDERSEA ADVENTURES— BIMINI ISLAND

Brown's Marina, Bimini, Bahamas. Phone: 305-763-2188.

RESERVATIONS: Bimini Undersea Adventures, Post Office Box 4960, Fort Lauderdale, Florida. Phone: 305-763-2188.

LOCATION—Dive shop and boat located at Brown's Marina in North Bimini. Hotel rooms available on both north and south Bimini. 30 minutes from airport which is on South Bimini.

TRANSPORTATION—Air: Chalk's seaplane from Miami, Charter: Atlantic Coastal Airways, Trans Island Airways, from Ft. Lauderdale. Ground: Taxi from airport to ferry \$2.50, taxi from ferry to North Bimini \$2.50.

ACCOMMODATIONS—Six hotels or inns located on both north and south Bimini. All offer waterfront views and air conditioning with total of one hundred and fifteen rooms. Prices range from economy to luxury. Major credit cards accepted.

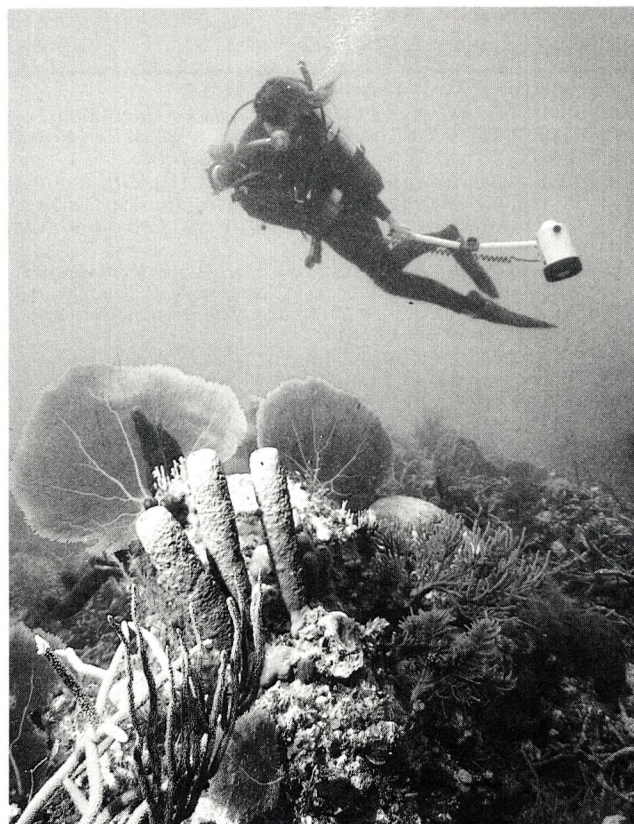
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns no	Beach dives no

DIVING EQUIPMENT—Mako and Ingersoll—Rand compressors. 2600 PSI. Fifty 72 cu/ft tanks. Two boats include 28 ft. custom platform and 26 ft Sportfisherman, with thirty-two diver capacity. No retail sales. Basic rental gear available. Boat rentals available at Brown's Marina for nominal rate. No photo equipment available.

DIVING SERVICES—PADI and NAUI affiliation. No instruction available. Cost per half day diving \$25 includes two dives, full day diving \$30 includes three dives, night dive \$25. Tanks/Bac Pac, weight belt, and lead included in cost.

DIVING PACKAGES—8 days/7 nights for \$435 per person. 7 days/6 nights for \$385 per person, 5 nights for 335 per person, 5 days/4 nights for \$285 per person, 4 days/3 nights for \$235 per person, 3 days/2 nights for \$200 per person, 2 days/1 nights for \$150 per person. Includes round trip air fare from Ft. Lauderdale, all meals, ground transfers, accommodations (double occupancy), 3 dives per day, tanks, bac pac, weights.



CAPE ELEUTHERA RESORT— ELEUTHERA ISLAND

P.O. Box 48, Rock Sound, Eleuthera, Bahamas. Phone: 809-334-2152.

RESERVATIONS: Sun Country Resorts, 201 Alhambra Circle, Coral Gables, Fla. 33134. Phone: 305-442-7200; 800-372-8776 (except Fla. 800-432-8251).

LOCATION—Situated on the beach at Powell Point on the southern end of Eleuthera Island with private airstrip 5 miles from hotel. 26 miles from Rock Sound Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami, Shawnee from Ft. Lauderdale and Miami. Charter: Trans Island Airways from Ft. Lauderdale. Ground: taxi from Rock Sound Airport \$6 for 2 people, bicycle and moped rentals available at hotel.

ACCOMMODATIONS—75 private air conditioned villas accommodate 1-4 people each and include bedroom, bathroom, sitting room, 8-track stereo system and balcony. Hotel and club complex borders Exuma Sound and has complete resort facilities with private marina and two beaches. Rates: single for \$57-92 (Modified American plan), double for \$80-126 (Modified American plan). 15% service charge. Amex, Diners Club, Carte Blanche, MasterCard accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives yes

DIVING EQUIPMENT—Worthington compressor, 20 cfm, 5000 PSI. 80 tanks: 60, 72 cu/ft; 20, 80 cu/ft. 3 dive boats, 31-ft Bertram, 23-ft Mako, 55-ft steel double-hulled cruiser with total diver capacity of 40. Retail sales available. Tank/bac pac, mask/snorkel, wt. belt/lead, regulator, fins included in dive rate.

DIVING SERVICES—PADI, NAUI affiliation. 6 instructors and 2 dive masters available. Resort course \$17.50. Full certification and advance diving courses on arrangement. U/W photography and film on site. Cost/full day diving \$30 for 3 dives, same rate for night dive.

DIVING PACKAGES—7 nights for \$489 per person double occupancy; 5 night for \$399 per person; 2 nights for \$216 per person. Includes round-trip air fare from Miami, airport transfer, private villa, breakfast & dinner, and full use of resort facilities.

**You'll know how much
you loved Cape Eleuthera
when it breaks your
heart to reach 300 p.s.i.**

Cape Eleuthera Bahamas

RESORT GUIDE

CHUB CAY CLUB— CHUB CAY, BERRY ISLANDS

Chub Cay, Berry Islands, Bahamas. Phone: 809-325-1490.

RESERVATIONS: Chub Cay Club, P.O. Box 661067, Miami Springs, Fla. 33166. Phone: 809-325-1490. Or Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Private-membership club, now open to the sport diver, situated on a small private island, the southernmost cay in the Berry Islands chain, at the northern edge of the Tongue of the Ocean. 30 miles northwest of Nassau. One-half mile from Chub Cay airstrip.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Charter: Trans Island Airways from Ft. Lauderdale and Nassau. Ground: Air conditioned courtesy bus meets all flights. Bicycle rentals available. No car rentals.

ACCOMMODATIONS—18 rooms in Yacht Club overlook the marina, 20 rooms in Beach Club overlook pool and ocean, 2- and 3-bedroom villas with private beaches, and a moored 4-bedroom houseboat all have air conditioning and private bath. Some villas have kitchenettes and furnished patios. Rates: double for \$35-60 (European plan), 2-BR villa \$100-120, 3-BR villa \$130-180, houseboat \$140-160. Amex, Master Charge, Visa credit cards accepted.

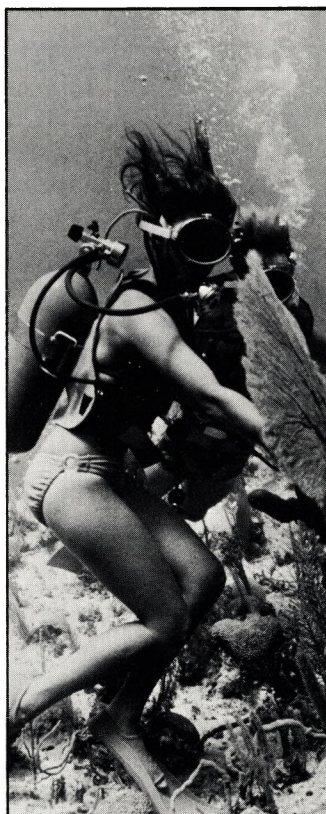
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Worthington compressor, 5000 PSI. Eighty 80 cu/ft tanks. 3 dive boats include 26-ft dual hull flat top, 26-ft Proline and 36-ft tri hull flat top. Retail sales available. Wt. belt/lead \$6.50/day, regulator \$6.50/day, fins \$1.50/day.

DIVING SERVICES—NASDS, PADI affiliation. 2 dive masters available, no instruction. First aid/CPR and camera film on site. Cost/half-day diving \$13 for 1 dive, full day \$32 for 3 dives, night dive \$13.

DIVING PACKAGES—8 days/7 night for \$513-640 per person, double occupancy; 4 days/3 nights for \$299-359; 3 days/2 nights for \$246-280. Includes breakfast & dinner, round trip air fare from Miami or Ft. Lauderdale, airport transfers, gratuities, taxes and 3 dives per day.



CHUB CAY, BERRY ISLANDS

**Chub Cay
Club**

A 'slightly luxurious' dive camp—with a lot more going for it.

- record setting big game fishing
- miles of beaches & superb shelling
- tennis, olympic pool & golf driving range
- marina for yachts of any size & 5000' strip for private planes
- beach club or yacht club rooms & villas for groups or families

CHUB CAY CLUB

P.O. Box 661067
Miami Springs, Fl. 33166
(809) 325-1490

CURRENT YACHT & DIVING CLUB— ELEUTHERA ISLAND

Current, Eleuthera, Bahamas. Phone: 809-333-2290.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Situated on the beach within walking distance of the village of Current. Nine miles from North Eleuthera airport at the extreme northwestern end of Eleuthera.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami, Shawnee from Ft. Lauderdale and Miami. Charter: Trans Island Airways from Ft. Lauderdale. Ground: Taxi from airport for \$8.75 for two people, rental cars available for \$25-\$30 per day, bicycles for \$3 per day.

ACCOMMODATIONS—19 cottage-style air-conditioned two-room suites with living room, bedroom, bath and patio. All units located directly across from marina in grove of coconut palms and cauarina trees. Rates: single for \$58-\$63 (American plan), double for \$72-\$85 (American plan); 10% service charge; maximum rates in effect Dec. 15 through April 25; Amex, Visa and MasterCard credit cards accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns no	Beach dives no

DIVING EQUIPMENT—Worthington compressor, forty air cylinders, three boats including a fifty-foot sportfisherman with a twenty to twenty-five diver capacity. No retail sales. Mask, fins, snorkel, weight belt, tank and bac pac included. No photo equipment available.

DIVING SERVICES—PADI, NAUI. Affiliation. No instruction available. Rental gear available. Cost per dive: \$15; maximum of two per day.

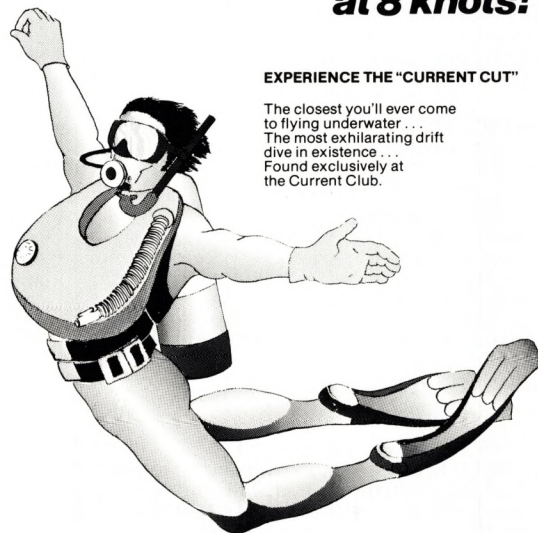
DIVING PACKAGES—8 days/7 nights for \$365 per person double occupancy; 5 days/4 nights for \$219 per person. Includes all meals, accommodations, two tanks per day and all gear except regulator and buoyancy compensator.

GET CARRIED AWAY...

at 8 knots!

EXPERIENCE THE "CURRENT CUT"

The closest you'll ever come to flying underwater...
The most exhilarating drift dive in existence...
Found exclusively at the Current Club.



current club The Diver's Highway
N. Eleuthera, Bahamas

RESORT GUIDE

CUTLASS BAY YACHT CLUB— CAT ISLAND

New Bight, Cat Island, c/o Box N-4839, Nassau. Phone: 809-322-2000.

RESERVATIONS: Cutlass Bay Club, 550 S. Federal Hwy., Suite 104, Ft. Lauderdale, Fla. 33301. Phone: 800-327-2272 (except Florida 305-467-7219).

LOCATION—Beachfront location on two hundred and twenty acres at the southern tip of Cat Island, five miles from the town of Port Howe. 2300-foot airstrip on premises. Eight miles from the Bight airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Charter: Trans Island Airways from Ft. Lauderdale. Ground: Hotel courtesy car and rental car available.

ACCOMMODATIONS—Eight double roomseach have two double beds and private porch. Sports complex includes two Bahamian-style cottages on a 2000-foot white sand beach, a five-minute walk from the marina. Rates: single for \$35 (European plan), double for \$70 (European plan), 10% service charge. Credit cards are not accepted.

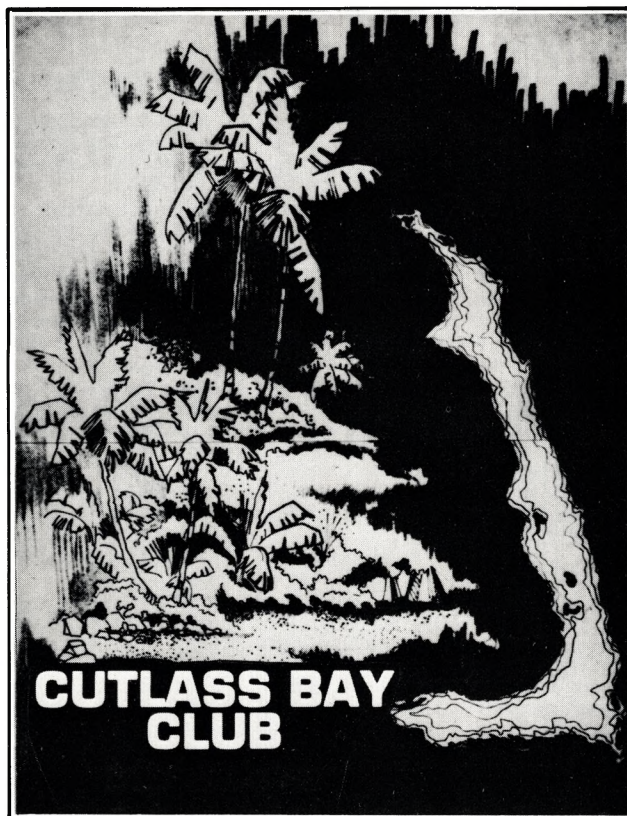
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls no	Drift dives no
Mid reef (33'-66') yes	Wrecks no	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives yes

DIVING EQUIPMENT—Mako 6 cfm compressor, total air bank capacity five 400 cu/ft. 60 tanks: 47, 72 cu/ft; 13, 80 cu/ft. Five boats include 16-ft. Boston Whaler and 27-ft. Platform. Total diver capacity is 16. There are no retail sales. Tank/bacpac, belt, weights, boat and guide are included in dive. There is no photo equipment available.

DIVING SERVICES—PADI, NAUI, YMCA affiliation. Instructor and 2 dive masters available. Resort course \$35. Full certification available. Cost/half-day diving \$25 for 2 dives, full day \$35 for 3 dives, night dive \$15.

DIVING PACKAGES—8 days/7 nights for \$510 per person includes airfare from Ft. Lauderdale, all meals, accommodations, unlimited diving and tanks, weights, belts and bac pacs. 3 and 6 day packages also available.



OUT ISLAND INN— GREAT EXUMA

George Town, Great Exuma, Bahamas. Phone: 809-336-2171.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Situated on the south-central end of Great Exuma on the eastern shore, perched on a hill overlooking Elizabeth Harbour; two miles from George Town and five miles from George Town airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Charter: Shawnee from Miami and Ft. Lauderdale, and Trans Island Airways from Ft. Lauderdale. Ground: Taxi from airport for \$4.00 round trip, car rentals available.

ACCOMMODATIONS—Scattered small cottages house eighty-eight rooms all with air conditioning and balcony. All rooms have two double beds and waterfront view. Resort complex faces 900-ft beach on four and one-half acres with private marina. One mile to town and shopping center. Rates: single for \$68-84 (Modified American plan), double for \$60-84 per person (Modified American plan); maximum rates in effect Dec. 15-Apr. 15. Amex credit cards accepted.

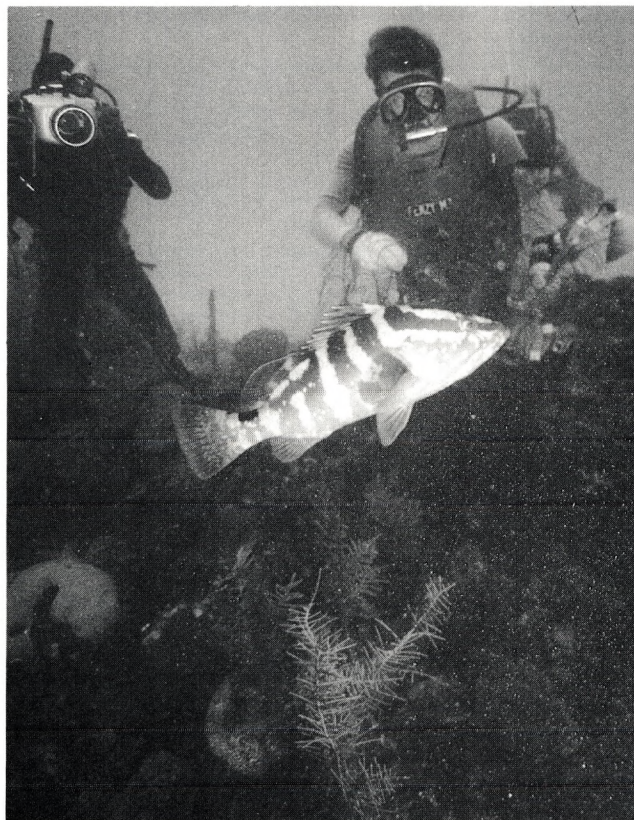
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls no	Drift dives no
Mid reef (33'-66') yes	Wrecks no	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives yes

DIVING EQUIPMENT—Mako 5 cfm compressor, 3000 PSI. 30 tanks: 4 72 cu/ft, 26, 80 cu/ft. Three, 38-ft, 23-ft and 18-ft, boats with a total diver capacity of 32. Tank/bac pac, wt. belt/lead included in dive. U/W light \$2 per day. U/W camera \$12 per day.

DIVING SERVICES—PADI affiliation. 1 instructor and 1 dive master available. Resort Course, full certification and advance diving courses available. U/W photography and film on site. First Aid/CPR available. Cost/half-day diving \$20 for 1 dive; full day \$35 for 2-3 dives; night dive \$25.

DIVING PACKAGES—4-day minimum, diving rates \$20 per person per day.



RESORT GUIDE

ROBERTS BEACH RESORT/HARBOUR CLUB—SPANISH WELLS

P.O. Box 31, Spanish Wells, Bahamas. Phone: 299 Spanish Wells.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Located on North Spanish Wells, off the northwest coast of Eleuthera Island, both properties face the beach. 15 minutes from North Eleuthera Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami, Shawnee from Ft. Lauderdale and Miami, Charter: Trans Island Airways from Ft. Lauderdale. Ground: Taxi from airport \$6 per person, guests met at airport on request.

ACCOMMODATIONS—Thirty-six double rooms and fourteen cottage apartments all have air conditioning and balcony. Apartments have kitchen facilities. Club sits on a ridge which slopes to a private beach and all rooms face the ocean. 866' waterfront at Roberts Beach Resort, 140' waterfront at Roberts Harbour Club. Rates: double for \$33-45 (European plan), cottages for \$45-65 (European plan). Maximum rates in effect Dec. 15-Apr. 15. Amex credit cards accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls no	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives no
Deep reef (66'-99') no	Caverns yes	Beach dives yes

DIVING EQUIPMENT—Mako compressors, 3200 PSI. Thirty 72 cu/ft tanks. Three boats include 19-ft. Mako, 22-ft Aquasport, and 27-ft Concord. Total diver capacity 26. No retail sales available. Tank/bac pac, mask/snorkel, wt. belt/lead, regulator included in dive.

DIVING SERVICES—PADI, NAUI and NASDS affiliation. Full certification course available with all gear included in rate. Mask, snorkel, and fins use free, compliments of the management. Personal boat and motor made available during your stay for nominal rate.

DIVING PACKAGES—8 days/7 nights for \$298 per person double occupancy; 5 days/4 nights for \$96 per person; 3 days/2 nights for \$99 per person. Includes one tank dive (second dive \$6) and two meals per day.



ROMORA BAY CLUB—HARBOUR ISLAND

Box 146, Harbour Island, Bahamas. Phone: 809-333-2325.

RESERVATIONS: Omorka Limited, P.O. Box 76721, Atlanta, Georgia 30328. Phone: 404-428-1588.

LOCATION—Restored estate on a secluded cove one mile from Dunmore Towne. Four miles from North Eleuthera Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Shawnee from Ft. Lauderdale and Miami. Charter: Trans Island Airways from Ft. Lauderdale. Ground: taxi from airport to water taxi \$1.25 per person, water taxi from Eleuthera to Harbour Island \$2 per person. Rental cars available on Harbour Island.

ACCOMMODATIONS—22 rooms, all with air conditioning and terraces situated on 10 acres facing the harbor and beach sides of the island. 5 rooms have kitchen facilities. Rates: single for \$68-82 (American plan), double for \$94-110 (American plan). Maximum rates effective Dec. 15-Apr. 15. 10% service charge. Amex, Master Charge and Visa credit cards accepted.

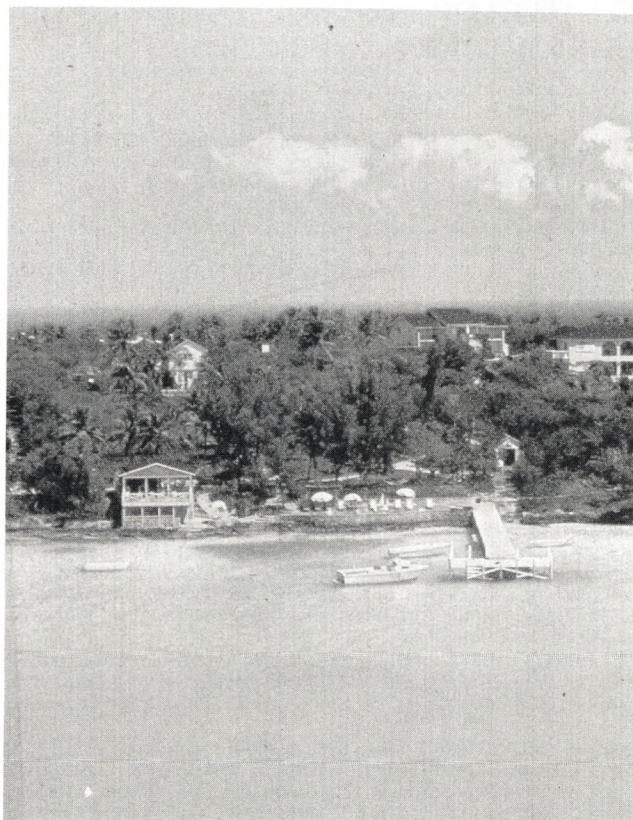
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives yes

DIVING EQUIPMENT—Worthington compressor, 3000 PSI. Forty tanks, all 72 cu/ft. Three dive boats include two 25-ft inboard and one 28-ft outboard with diver capacity of twelve per boat. No retail sales. Tank/bac pac, mask/snorkel, wt. belt/lead and fins are included in dive charge.

DIVING SERVICES—NAUI, YMCA affiliation. 2 instructors and 2 dive masters available. Resort course \$22, full certification \$100 or \$85 for groups of 2 or more. Cost/half-day diving \$17 for single tank, \$25 for double tank, night dive \$23.

DIVING PACKAGES—4 days/3 nights for \$399 per person. Double occupancy (\$299 non divers). 7 days/6 nights for \$641 per person double occupancy (\$491 non divers). Includes round trip airfare from Ft. Lauderdale to Eleuthera, 3 meals/day, taxes, gratuities, transfers, Unlimited beach diving, 3 boat dives/day, basic gear.



RESORT GUIDE

SCUBAHAMAS/VICTORIA INN— GRAND BAHAMA ISLAND

P.O. Box F-1261, Freeport/Lucaya, Grand Bahama Island, Bahamas.
Phone: 809-373-3040.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, FL 33134. Phone: 305-443-3821, 800-327-0787 (except FL 800-432-5594).

LOCATION—Located on Midshipman Road in Lucaya, twenty yards from Marina, one-quarter mile from the ocean, five miles from the Airport.

TRANSPORTATION—Air: Bahamasair from Miami and Ft. Lauderdale. Charter: Trans Island Airways from Ft. Lauderdale. Ground: Taxi from airport to Inn \$4. Complimentary bus service to town and beach twice daily.

ACCOMMODATIONS—40 rooms in circular inn overlook the pool and grove of coconut palms. All rooms with private bath and air conditioning. Rates: single for \$23, summer, \$37 winter (European plan), double for \$28, summer, \$42 winter (European plan). VISA credit card accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Ingersoll-Rand compressor 2500 PSI. Seventy 72 cu/ft tanks, two dive boats including 42 ft Bristol with a 35 diver capacity. Full retail sales. Basic gear available for rental. Underwater camera rental \$10/dive.

DIVING SERVICES—PADI affiliation. Two instructors, one dive-master. Resort course \$29, full certification \$100, includes three open water dives. Cost for one-half day diving \$16 per person, full day diving is \$30 per person, night dive is \$25 per person which includes lights.

DIVING PACKAGES—Packages available based on daily rate for double occupancy. \$25 per person per day summer (European plan). \$35 per person per day winter (European plan). Includes accommodations, tank/bac pac, air, and boat. There is a minimum of one dive per day.

VICTORIA inn



& SCUBA CLUB

SEA FEVER DIVING CRUISES— CAY SAL BANK AND BIMINI

Key Largo, Florida. Phone: 305-451-0005.

RESERVATIONS: Sea Fever Diving Cruises, c/o Captain Tom Guarino, P.O. Box 1335, Key Largo, Fla. 33037. Phone: 305-451-0005.

LOCATION—Situated at Mile Marker 100 in Key Largo, docked adjacent to the Holiday Inn, within walking distance of center of Key Largo. One-half mile from Key Largo Airport.

TRANSPORTATION—Air: Air Sunshine from Miami. Private plane fixed base operator at Key Largo Airport. Ground: Courtesy transfer from airport to boat. Access Routes: located off Highway 1 near center of town.

ACCOMMODATIONS—40-ft long range diesel cruise boat can accommodate eight divers in comfortable single bunks for Island cruises and seventeen divers for local cruises. Cabin sleeps eight, upper deck sleeps two. Kitchen facilities, radio, large dive platform, chase boat, sundeck on board. Enclosed private head, air compressor, fathometer, S.S.B., VHF and C.B. radio. Rates: \$55 per person per day (American plan), four day minimum.

DIVING AVAILABLE—

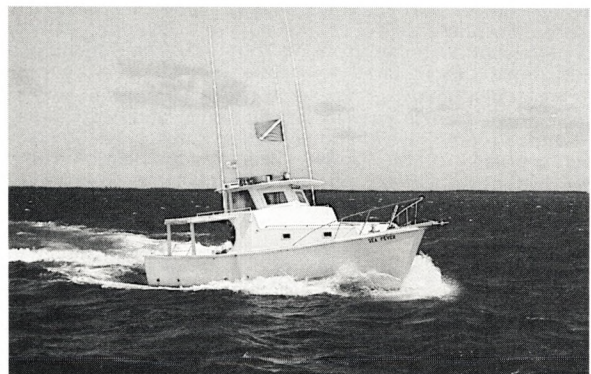
Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Mako compressor, 2600 PSI. Sixteen 72 cu/ft tanks, 40 ft vessel designed by divers for island trips with 12-ft 25 HP motor chase boat. No retail sales. Tank/bac pac, regulator weights, air included in rate. Rental gear available. Photo equipment available from local dive shop.

DIVING SERVICES—PADI affiliation. One instructor and one dive-master available. Full certification and advance diving courses arranged. Unlimited diving on Island cruises. Perfect for the novice or experience diver.

DIVING PACKAGES—Four to ten day diving cruises to Cay Sal Bank (in Bahamas off the Florida Keys) and to Bimini for \$55 per person per day. Includes meals, air, tanks, weights, accommodations, unlimited diving. Meals prepared from seafood caught fresh daily and feature the best of island cuisine.

Sea Fever



Diving Cruises

RESORT GUIDE

SEAVENTURE INTERNATIONAL, INC.— BAHAMA ISLANDS

2280 N. Federal Highway, Boynton Beach, Fla. 33435. Phone: 305-723-9312.

RESERVATIONS: Seaventure International, Captain Dan Wagner, P.O. Box 1262, Melbourne, Fla. 32901. Phone: 305-723-9312.

LOCATION—Vessel docked at Gulf Street marina on east side of Boynton Beach, north of Palm Beach. 15 minutes from Palm Beach International Airport.

TRANSPORTATION—Air: Eastern, Delta and National Air Lines from Atlanta. Air Florida from major cities in Florida. Ground: major car rentals at Palm Beach International Airport. Access routes: marina is located off NE 22nd Ave., accessible from Highway 1 and Interstate 95.

ACCOMMODATIONS—75-ft long range cruise boat can accommodate thirty-two divers. Sleeping area fully air conditioned with nine doubles and ten singles. Large dive platform, two chase boats, photo lab, fishing bait and tackle. Specialized charters experienced in Bahama cruises. Available for 4-6 day dive cruises to Grand Bahama, Abaco, Bimini, Andros, Eleuthera and Berry Islands. No daily rates.

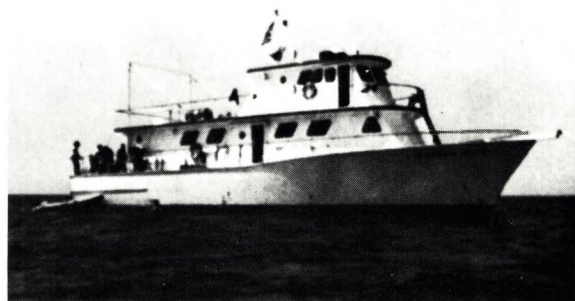
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Worthington compressor, 5000 PSI. Forty 72 cu/ft tanks. No retail sales. Tank/bacpac, mask, wt. belt/lead, regulator, fins \$3/day each. U/W camera rental \$10/dive. Complete photography lab on board.

DIVING SERVICES—YMCA affiliation. 2 instructors and 4 dive masters. Resort course, full certification and advance courses available. U/W photography and spearfishing courses can be arranged. No full/half day dives available.

DIVING PACKAGES—6 days/5 nights for \$348 per person, 5 days/4 nights for \$286 per person, 4 days/3 nights for \$229 per person. Includes 3 meals per day, accommodations, air and unlimited diving. Basic gear available for rental.



SMALL HOPE BAY LODGE— ANDROS ISLAND

Fresh Creek, Andros, Bahamas. Phone: 809-328-2014.

RESERVATIONS: Small Hope Bay Lodge, P.O. Box N1131, Nassau, Bahamas. Phone: 809-327-2514. Or Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Located in Fresh Creek on east coast of Andros, facing Andros Barrier Reef. 6 miles from Andros Town International Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Charter: Trans Island Airways and Holiday Wings from Ft. Lauderdale. Ground: Taxi from the airport \$6.75 for two people, rental cars are available.

ACCOMMODATIONS—Twenty rooms in cottages of coral rock and Andros pine situated in a pine grove in a secluded natural setting facing a 200-ft. private beach. All rooms are on the beach, have private baths, hot tubs, some have water beds. Rates: double for \$76 (Modified American plan); 10% service charge. Amex credit cards are accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives yes

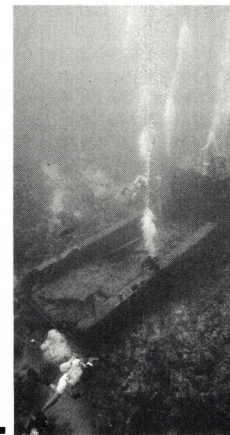
DIVING EQUIPMENT—Two Joy compressors, 2250 PSI. Sixty 72 cu/ft tanks. Three 28-31 ft Flatop pontoon boats with a total diver capacity of 45. Complete retail sales. Tank/bacpac, mask, weight belt/lead and regulator included in dive. Camera film and photo finishing available.

DIVING SERVICES—NAUI, PADI, NAA affiliation. Five instructors available. Free resort course offered. Cost for one-half day of diving is \$14 (1-2 dives); cost for full day of diving is \$28 (2-4 dives); night dive \$18.

DIVING PACKAGES—7 days/7 dives for \$337 single, \$674 double. 7 days/21 dives for \$407 single, \$814 double. Includes two meals, accommodations and all dive gear except bc's and wet suit which are available for rental.



from
here



to
there

WE HAVE IT ALL

Small Hope Bay

FRESH CREEK • ANDROS • BAHAMAS

RESORT GUIDE

STELLA MARIS INN/CAPE SANTA MARIA CLUB—LONG ISLAND

Stella Maris, Long Island, Bahamas. Phone: 305-764-8309/8296.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Inn: located on the northern tip of Long Island within walking distance of village, one-half mile from Stella Maris Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Charter: Trans Island Airways. Ground: taxi from airport to inn \$1 per person. VW Safari jeep \$24/day, motor bike \$17/day.

ACCOMMODATIONS—Inn: 36 suites and studio apartments in hotel and scattered cottages all have air conditioning, private bath and veranda. Clustered complex is surrounded by landscaped gardens and overlooks the ocean one-half mile from marina. Rates: Inn, Single for \$41-46 summer, \$50-59 (Full American plan); Double for \$59-64 summer, \$72-79 winter (Full American plan). 10% service charge, tax \$1 per person per night. Amex accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—4 Mako/Bauer compressors: 2 mobile diesel, 2 electric, 2500 PSI. Eighty 72 cu/ft tanks. Three boats, 28 ft., 42 ft., 57 ft. with diver capacity of 60. Standard gear included in all rates. Full retail sales. U/W camera rentals from \$12.

DIVING SERVICES—PADI, BARAKUDA affiliation. Three instructors and four dive masters. Resort course \$38 for 2 days. Scheduled full certification and advance diving courses \$150. U/W photo and wreck diving on request. Photo equipment and first aid/CPR available. Cost/half-day diving \$15 for 1 dive, full day \$24-30 for 2-3 dives, night dive \$25.

DIVING PACKAGES—8 days/7 nights for \$402-461 summer, \$447-550 winter per person double occupancy. Minimum rates for inn, maximum rates for club. Includes all meals, accommodations, airfare from Nassau, basic gear and 2-3 dives/day.

visit shark reef

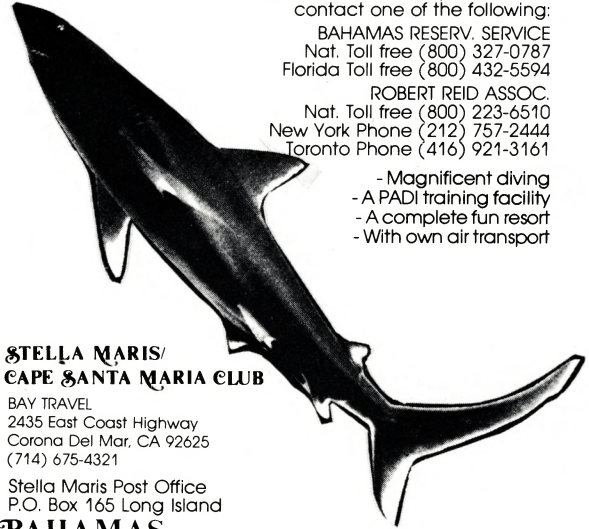
"The most exciting dive in the Bahamas"

For more information/reservations contact one of the following:

BAHAMAS RESERV. SERVICE
Nat. Toll free (800) 327-0787
Florida Toll free (800) 432-5594

ROBERT REID ASSOC.
Nat. Toll free (800) 223-6510
New York Phone (212) 757-2444
Toronto Phone (416) 921-3161

- Magnificent diving
- A PADI training facility
- A complete fun resort
- With own air transport



STELLA MARIS/CAPE SANTA MARIA CLUB

BAY TRAVEL
2435 East Coast Highway
Corona Del Mar, CA 92625
(714) 675-4321

Stella Maris Post Office
P.O. Box 165 Long Island

BAHAMAS

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

UNDERSEAS, INC., DIVING CRUISES—CAY SAL BANK

Big Pine Key, Florida 33043. Phone: 305-872-2700/9555.

RESERVATIONS: Underseas, Inc., c/o Captain George Rockett, Post Office Box 319, Big Pine Key, Florida 33043. Phone: 305-872-2700; 305-872-9555.

LOCATION—Situated at Mile Marker 31 in Big Pine Key halfway between Key West and Marathon, Fla., 17 miles from Marathon Airport.

TRANSPORTATION—Air: Air Sunshine from Miami. Private plane fixed base operator at Marathon Airport. Ground: rental cars available at airport. Access route: located on Highway 1, 120 miles south of Miami.

ACCOMMODATIONS—40-ft, long-range cruising boat sleeps six in comfortable bunks. Equipped with Single Side Band, VHF, C.B. Radio, two fathometers, large enclosed head, stereo, staircase boarding ladder, underwater speaker, twin diesel engines, air compressor, 13-ft utility boat. Available for daily reef trips and three to seven day Cay Sal cruises. Rates: \$350 per person per day for cruises. Amex, Carte Blanche, Diners Club and Master Charge credit cards are accepted.

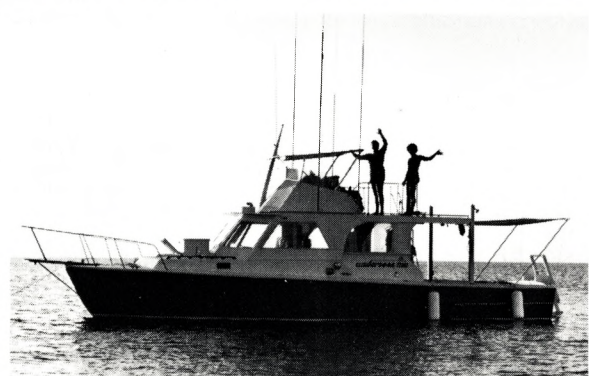
DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives no
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns no	Beach dives no

DIVING EQUIPMENT—Two Worthington compressors, 20 CFM, 5000 PSI. 75 tanks. Three boats include a diesel powered fiberglass boat built for diving cruises. Full service retail sales. Tanks and weight included in rates. Mask/snorkel \$2/day, regulator \$5.50, fins \$1.50, U/W camera \$7.50.

DIVING SERVICES—PADI affiliation. 2 instructors and 2 safety assistants. Full certification course \$150. Cost/half-day \$15 for 2 dives, full day \$20 for 3 dives, night dive \$25.

DIVING PACKAGES—Experienced charters specializing in and around the Cay Sal Bank. 3- to 7-day cruises for \$350 per person per day. Includes all meals, accommodations, ice, air, soda, beach picnics, fishing bait and tackle, and unlimited diving. Daily reef trips to Looe Key also available.



RESORT GUIDE

UNDERWATER EXPLORERS SOCIETY— GRAND BAHAMA ISLAND

Freeport/Lucaya, Grand Bahama, Bahamas. Phone: 809-373-1244.

RESERVATIONS: Unexso, P.O. Box F2433, Freeport, Grand Bahama. Phone: 809-373-1244. Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821, 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Situated on the water in Lucaya, one-quarter mile from the ocean in the Lucayan Bay Hotel complex. Six miles from the airport.

TRANSPORTATION—Air: Bahamasair from Miami and Ft. Lauderdale. Eastern air from Miami. Delta airways from New York. Ground: Taxi from airport \$4.50, major car rentals at airport. Private plane facilities at Freeport International Airport.

ACCOMMODATIONS—Seventeen major hotels in Freeport/Lucaya ranging from economy to luxury with 2,000 rooms. Many with oceanview, private balcony. Casino gambling in Freeport. Major credit cards accepted at hotels.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Twin Ingersoll-Rand compressors, 3500 PSI. One hundred and thirty 72 cu/ft tanks, two boats include 42ft Thomas with a 42 diver capacity. Full retail sales. Dive complex includes 18-ft training pool, museum, recompression chamber, health club, photo darkroom and lounge.

DIVING SERVICES—NAUI, PADI affiliation. Nine instructors with nine divemasters. Instruction available from resort courses to advance diving. Cost per dive: \$19, with an allowed maximum of three per day.

DIVING PACKAGES—4 days/3 nights for \$84 summer, \$117 winter per person double occupancy. 8 days/7 nights for \$196 summer, \$273 winter per person double occupancy. MAP (breakfasts and dinner daily) add \$15 per person daily. Includes accommodations, all necessary scuba gear, introductory course for the novice.



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P.O. Box 1, Harbour Island, Bahamas. Phone: 809-333-2142.

RESERVATIONS: Bahamas Reservation Service, 255 Alhambra Circle, Suite 435, Coral Gables, Fla. 33134. Phone: 305-443-3821; 800-327-0787 (except Fla. 800-432-5594).

LOCATION—Just north of Eleuthera Island on the west side of Harbour Island. 15 minutes from North Eleuthera Airport.

TRANSPORTATION—Air: Bahamasair from Nassau and Miami. Shawnee from Ft. Lauderdale and Miami. Charter: Trans Island Airways from Ft. Lauderdale. Ground: Water taxi from Eleuthera to to Harbour Island \$2.00 per person, taxi from airport to water taxi \$1.25 per person, rental cars on Harbour Island \$20 per day.

ACCOMMODATIONS—Twenty-seven rooms with ceiling fans and terrace overlooking bay. Five acres with 300 feet of waterfront. Marina on ocean side. Rates: single for \$25-30 (European plan), double for \$35-45 (European plan), 10% service charge, maximum rates in effect Dec. 15-Apr. 15. Amex and Visa credits cards are accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns no	Beach dives yes

DIVING EQUIPMENT—Worthington and Mako compressors, 4000 and 8000 PSI. 37 tanks: 20, 72 cu/ft and 17, 80 cu/ft, four boats from 19 to 35-foot with a 6-10 diver capacity. Retail sales available. Mask, fins, buoyancy compensator, regulator, tank, weight belt-lead, air included in each dive.

DIVING SERVICES—All major certifications accepted. Instructor and dive master available. Resort course \$70 includes 5 open water dives. Full certification and advance diving courses available for groups only. Cost/half-day diving \$25 for 2 dives, full day \$37.50 for 3 dives, \$50 for 4 dives, night dive \$12.50.

DIVING PACKAGES—April 29-Dec. 14, \$25/person/day. Dec. 15-Apr. 28, \$35/person/day. Includes all meals, accommodations, tax and gratuities. Diving \$10 additional/dive/person with 1 tank, \$15 additional/dive/person with 2 tanks.



RESORT GUIDE

WALKER'S CAY CLUB— ABACO ISLAND

Walker's Cay, Abaco Island, Bahamas.

RESERVATIONS: Omorka Limited, P.O. Box 76721, Atlanta, Georgia 30328. Phone: 404-428-1588.

LOCATION—First class resort hotel and marina in secluded tropical setting on Walker's Cay, northernmost island of the Abaco chain. Airstrip at entrance to club.

TRANSPORTATION—Air: private Walker's Cay Air from Ft. Lauderdale. Charter: Trans Island Airways and Shawnee from Ft. Lauderdale. Ground transportation: all flights land at entrance to the hotel, no taxi transfers are necessary.

ACCOMMODATIONS—Thirty-four air conditioned guest rooms have sundeck overlooking the ocean. Five 2-bedroom villas include living room. Full resort hotel with marina on site. Rates: single for \$74 (Modified American plan), double for \$103, triple for \$137. Villas: single for \$154, double for \$176, triple for \$227. Maid service \$1 additional per day. 15% service charge. Amex, Master Charge and Visa credit cards accepted.

DIVING AVAILABLE—

Shallow reef (5'-33') **yes**

Walls **no**

Drift dives **no**

Mid reef (33'-66') **yes**

Wrecks **yes**

Night dives **yes**

Deep reef (66'-99') **yes**

Caverns **no**

Beach dives **no**

DIVING EQUIPMENT—Innerspace Research electric compressor, 3000 PSI. Twenty-four 80 cu/ft tanks. Two boats including 34 ft open-end dive boat with sun roof and 28-diver capacity. No retail sales. All basic gear is available for rental. No photography equipment is available.

DIVING SERVICES—YMCA and PADI affiliation. Two instructors and one divemaster. Resort course and full certification available, advance diving courses arranged. Cost per dive included in package rates.

DIVING PACKAGES—4 days/3 nights for \$316 per person double occupancy; 7 days/7 nights for \$602 per person double occupancy. Includes round-trip air fare from Ft. Lauderdale to Walker's Cay, meals, tax, gratuities and two dives per day with basic equipment.



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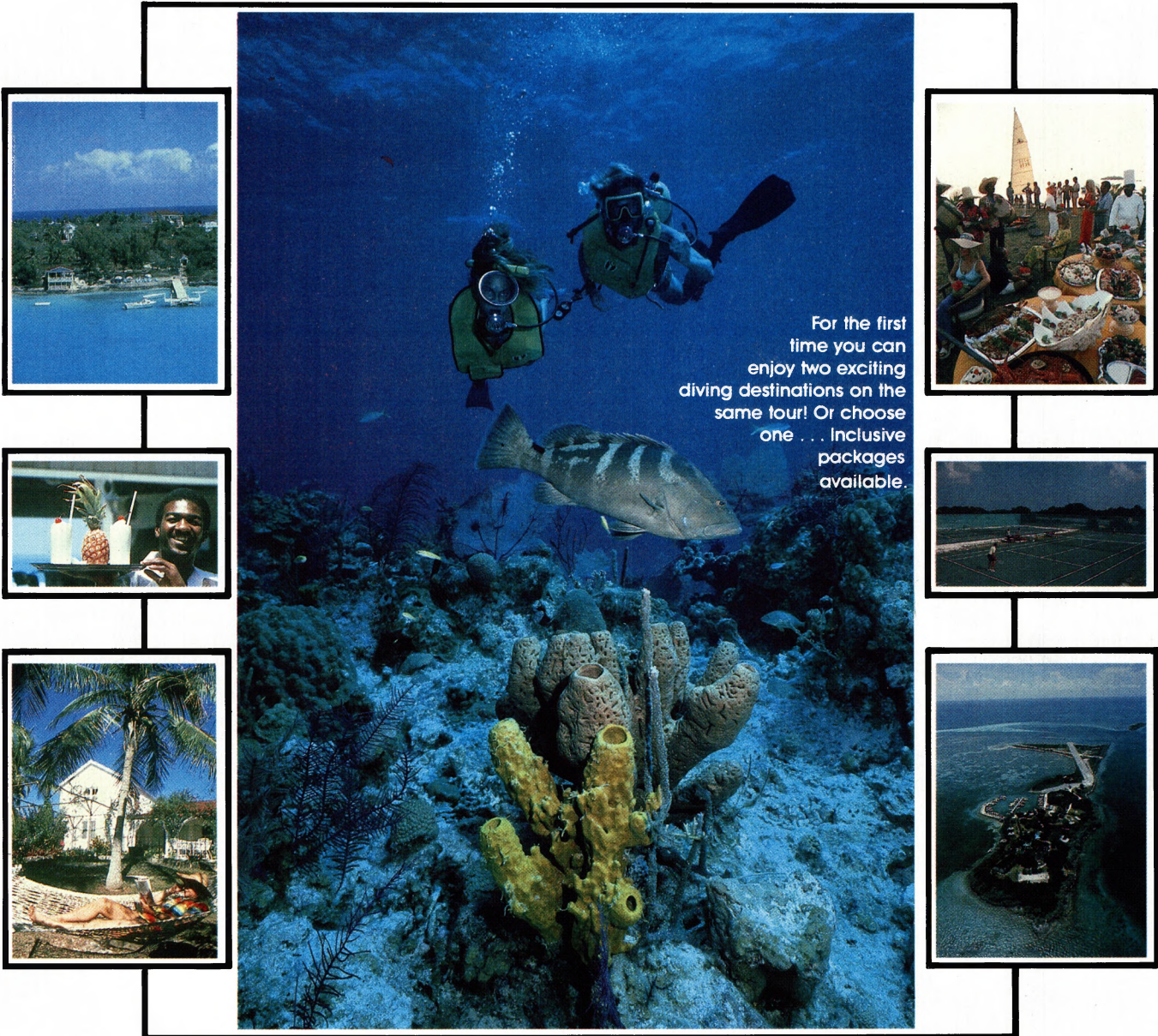
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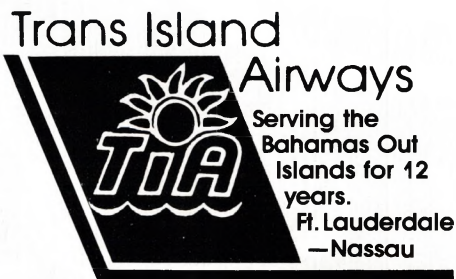
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PHYSICAL CONDITIONING

A Prescription for Fitness

Diving takes more effort than you think—and if you're not ready, you could be headed for trouble.

BY DR. PATRICK BRAY

Are you ready to go diving again after a layoff of several weeks or even months? Just exactly how physically fit are you for diving?

If you need to shape up, what is a reasonable goal and how do you reach it?

Answering these questions isn't a simple matter. Despite the enormous general interest in physical fitness, there has been little attention given to the degree of fitness necessary for safe and enjoyable scuba diving.

To answer these questions of how much exercise is enough, let us define scuba diving as strictly recreational. I am excluding the working diver or semi-professional sport diver who frequently encounters unusual cold, stress, and strong currents. These divers need to be working toward an optimal degree of fitness based on a regular, strenuous training program. This article will offer guidelines for a basic, starting level of physical fitness upon which the recreational sport diver can build.

The actual work of sport diving is often underestimated, especially by new divers. On first impression, recreational diving may not appear to be a particularly rigorous activity as compared to jogging. The weightless world of neutral buoyancy makes moving about seem a relatively effortless task. Yet, the marginally fit novice diver often reports being tired after an initial dive, which is usually shallow and brief.

What are the sometimes unrecognized demands which you experience as a scuba diver?

First, there is the excitement, anticipation, and perhaps even mild apprehension about making a dive. These psychological sets, or states of mind, provoke extra adrenaline production which causes additional blood flow to large muscles, and there is a distinct rise in the heart rate.

Simply getting ready to enter the water is hard work. You sweat and squirm into a wetsuit, strap a 37-pound single tank on your back, add lead weights, don fins that impair your balance, and a mask that gives you tunnel vision. A typical diver preparing to enter the water on a hot day will register a heart rate high enough to be called the product of hard, continuous work. You get more of a work-out moving from the staging area to the water, walking into the surf being the extreme example.

Regardless of how you enter the water, each breath you draw now takes more work because the wetsuit constricts the chest and neck areas, and the regulator offers noticeable breathing resistance. Of course, you will be moving against the greater resistance of water. Any current will impose an extra demand. A final stress is the water temperature which is rarely, if ever, the proper temperature for thermal balance.

You wind up doing involuntary extra work when the water is too warm or (most likely) too cold. One example is shivering, which may increase your basic metabolic rate sixfold.

There are some factors which modify these stresses, such as the "diving reflex," which slows the heart rate. Buoyancy also eases things a bit, if you can manage to stay neutral. Still, before you get very far under water, the body is obliged to perform a fair amount

of exercise. A diver with low exercise tolerance is not likely to enjoy the underwater experience if he becomes fatigued at the outset. More important, fatigue is an all-too-frequent factor in diving accidents. Remember that fatigue usually is the result of a diver underestimating the environmental stresses. Add to this any unexpected psychological stress, and the unfortunate diver may well be headed for panic and tragedy.

A reasonable exercise prescription, if regularly followed, will greatly contribute to making scuba diving a pleasant and safe experience for you and your dive partners. All exercise programs and, of course, diving itself, must be preceded by a thorough medical evaluation, preferably by a health professional well-versed in diving medicine.

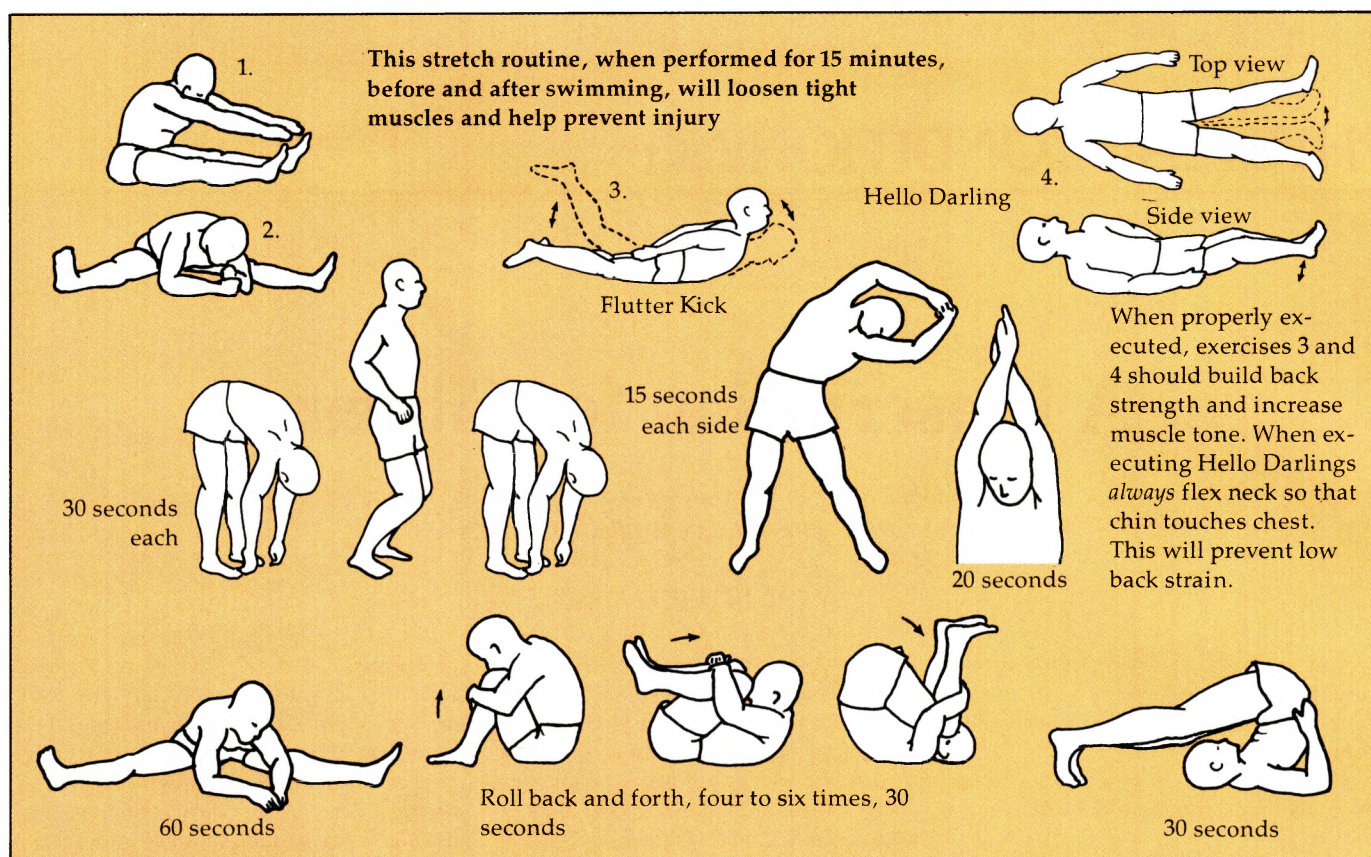
The major components of an exercise program for diving are:

- Stretching.
- Strengthening exercises.
- Cardiovascular-respiratory conditioning, i.e., "aerobic" conditioning, such as jogging and swimming.

Each component is important. The value of the first, stretching, is sometimes ignored. Like swimming, diving may engage practically all the muscle groups of the body. Muscles that are not properly stretched prior to vigorous use are at greater risk for soreness and injury. Stretching has importance beyond injury prevention, too, as it is the foundation for all movement and also provides excellent relaxation. The exercise prescription could actually prove counter-productive if stretching were not the very first component.

Second, strengthening or developmental exercises supplement stretching as a method of injury prevention. After

Dr. Patrick Bray is the Senior Medical Officer at the Naval School, Diving and Salvage in Washington, D.C.



a long lay-off the areas around joints and the lower back are especially vulnerable. Strength and endurance will both improve through a regular program of gradually increasing repetitions.

The third component, aerobic conditioning, has become for many Americans a national past-time. This type of exercise has been described in many published texts, but it is most closely identified with Dr. Kenneth Cooper's excellent book, *The New Aerobics*. By the aerobic method of exercise, you seek to improve the functioning of heart, lungs, and blood vessels by increasing the maximum amount of oxygen the body can use within a given time. It should be obvious that the resulting increase in exercise tolerance would be clearly beneficial in any sport.

Following a thorough medical examination, the next step is to make a quick assessment of your physical condition. The assessment tests described on page 88 represent a *minimum* standard for diving. They are not presented as an extensive inventory, but are merely a fair estimate. If you should fall below these standards, you should postpone your diving and immediately start an exercise program, a program which is definitely in your own best interests. If you surpass the minimum standards, you are advised to exercise beyond them.

The Specifics of the Exercise Pre-

scription Stretching: First, dismiss the attitude, "If it doesn't hurt, it isn't doing me any good." The stretching must be slow and passive, not bouncing or done to a stiff cadence. Proper stretching involves an effort which falls somewhere between easy movement and stress. Do not hold your breath while stretching. This interferes with relaxation, which is both a prerequisite and the result of proper stretching.

Strengthening: The exercises recommended here use only body weight and do not require any body-building apparatus, such as barbells or isometric "muscle builders". There are five basic exercises, three of which have been described in the section on assessment: the sit-ups, and the two forms of push-ups. The other two exercises are described in figures 3 and 4.

It is important to gradually build the number of repetitions. Unlike stretching, a moderately-paced cadence count is useful, especially when breathing is coordinated to the particular cadence you find comfortable.

Aerobics: Table 2 describes the necessary part of an aerobic program. You need to understand fully all three parts: frequency, intensity and duration. The jogger who tells you that he ran five miles today is really saying very little about his or her aerobic fitness program. There is an enormous aerobic difference between the runner who does five miles

a day, seven days a week at a pace of six minutes per mile, and the weekend athlete who runs five miles once a week at a pace of 10 minutes per mile. The convenience of Cooper's "aerobic point system" is that it computes the frequency, intensity and duration for you and comes up with a specific number with which you judge yourself on the fitness scale. For instance, if you get 30 points a week on Cooper's scale, it means you're doing fine; jogging, swimming or biking long enough, hard enough and enough times each week to stay fit.

To individualize your own training program and apply it to any sport or combination of sports, remember that frequency of exercise is somewhat a matter of personal preference. Exercising three to five days a week offers the advantage of establishing a routine and allowing it to gradually increase. Exercising more than five times a week, however, makes it likely (greater than a 50 per cent chance) that you will suffer an "overuse" injury.

Intensity and duration are closely linked. In Cooper's system, the exercise must raise your heart rate to a certain level and maintain it for a minimum of 10 minutes. That's enough to achieve what Cooper calls the "training effect," another way of saying your heart and lungs are doing enough work to maintain your fitness.

Although any regular aerobic activ-

ity will increase your exercise tolerance for diving, all training is ultimately specific. What you do a lot is what you do best. For example, cycling is the most efficient way to be a good cyclist. No amount of roughly equivalent running can totally substitute for the benefits of training in your specific sport. Hence, it is hardly surprising that those people who dive most often are usually in the best condition for diving.

But for most of us the opportunities for diving are rather limited. We need to substitute with the next best or most nearly equivalent activity. Swimming fits the prescription best. Swimming with strokes mostly powered by the legs (breast and side strokes) is a close approximation. Even better is snorkeling with fins. You won't find any equivalent aerobic "points" in Cooper's system for snorkeling, so you'll have to design your own program along the guidelines in Table 2.

You should also practice breathhold diving horizontally in a pool. With practice you can lengthen your breathholding time by lowering your body's response to carbon dioxide, which is a powerful stimulus to breathe. But you must carefully avoid excessive hyperventilation. Three good breaths, with emphasis on the exhalation, is a safe limit. Too much blow-off of carbon dioxide prior to horizontal breathholding may result in shallow water blackout. This loss of consciousness is caused by critically low levels of oxygen, which occurs at about 200 feet of horizontal excursion. A more reasonable goal is 75 feet on no more than two breaths. If you can swim the length of a 25 yard pool underwater without fins on a single breath you're doing quite well. If you can make 50 yards on three breaths (one going under initially and two during the excursion) you can probably pass at least one of the watermanship tests given to scuba instructors.

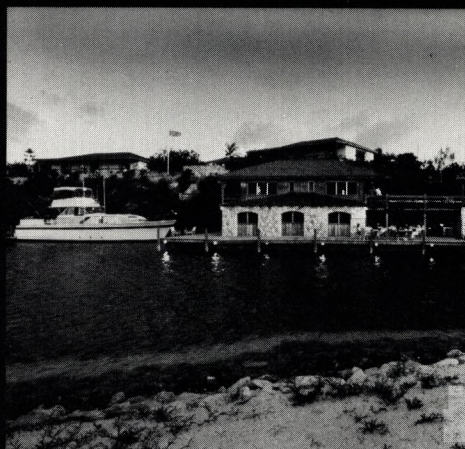
Finally, here is an exhortation concerning compliance with this prescription: *No exercise program is the least bit useful if it is not regularly followed.*

Find a routine you enjoy and stick with it. Some people find it helpful to reserve the same time each day exclusively for exercise. Some like the solitude of exercising alone while others opt for the support of a group. Either way is fine.

The hardest lesson to remember is to start slowly and build up gradually. A wise long-distance coach once advised, "Always discourage speed." In other words, avoid an overenthusiastic attitude which leads to overextending and injur-

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PHYSICAL CONDITIONING *continued*

ing yourself. Don't compete. Out-swimming your buddy is no way to make friends, and any improvements you may gain physically are hardly measureable.

Your initial gains will be impressive. But it doesn't take long to reach a plateau, after which further improvements come slowly and with difficulty. If the exercise routine isn't enjoyable, then it

becomes a burdensome chore when you're doing it, and a source of guilt when you lay-off. Getting in shape shouldn't be a pain. It should be satisfying and it should be fun.

For better overall health in general and better diving in particular you need to get your exercise prescription filled—and the sooner the better.

Table 1:
1.5 mile running test for
fair degree of fitness.

Age:	Time: (in minutes)
Under 30	12:01-14:30
30-39	13:01-15:30
40-49	14:01-16:30
50 or over	14:31-17:00

Divers may object to using a running-walking test to assess fitness for diving. But the running-walking test is mentioned here because it carries with it the largest amount of scientific data supporting it as a true overall test of aerobic fitness.

An alternative for those who find running unsuitable is a swimming test. Here evidence of a fair degree of fitness would be swimming 500 yards in 12½ minutes, using the breast stroke and/or side stroke. These strokes, unlike the crawl, use the leg muscles for most of the movement through the water.

The primary point to make about the aerobic test is that it must be of sufficient duration and intensity to test your endurance. If you've been getting little or no exercise lately, it would be wise to start exercising at a lower level and work up to the test. Don't push until you're able. Likewise, you *must* stop the test (or any exercise) when you feel chest pain, extreme fatigue, lightheadedness or nausea.

Here are three basic minimum tests:

Test No. 1: Flexibility. Sit on the floor with legs straight and fingers touching toes (figure 1). Then sit with legs spread and forehead on top of fists on the floor (figure 2). You should be able to hold each of these positions without discomfort for one minute.

Test No. 2: Strength. First, do 30 sit-ups in less than one minute. The

proper position for this exercise is knees bent and hands behind the head. Do not bounce when doing these sit-ups as neck injuries may occur. Second, do a series of push-ups from the knees ("woman's push-up") in the following sequence: 15, then 10, then five, with a 10 second rest interval between each set. The knee push-up, done correctly, is not as easy as it may appear. The back must be straight and the chest should lightly touch the floor. Placement of the hands and arm position determine which muscles are being tested. To assess and develop the upper arm, specifically the triceps, place the hands at shoulder width with the elbows tucked in next to the body. For chest (pectoral muscles) assessment and development you place the hands at slightly more than shoulder width and perform the push-ups with elbows out from the body.

Test No. 3: Aerobic condition. This test corresponds to Dr. Cooper's fitness Category III, a "fair" degree of fitness, as described in *The New Aerobics*. The most convenient test is the 1.5 mile run. The requirements are listed in Table One. This pace is slow enough to allow for some walking; that is, the 1.5 miles can be part running, part walking. Time is the critical factor. If you can't make the times listed in the table, you need to improve your endurance.

Table 2:

Frequency of Exercise and Intensity Frequency: Three to six days a week.

Intensity: Sixty to 90 per cent of maximum heart rate.

Duration: Ten to 60 minutes.

Activity: Jogging, biking, swimming or other continuous sports activity. Calculate maximum heart rate by 220 minus age, times either .6 or .9 for low- and high-level intensity exercises. Example: for low-range activity in a 40-year-old male, $220 - 40 = 180$, $180 \times 0.6 = 108$ pulse rate.

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The Living Sea:

The Flamingo Tongue

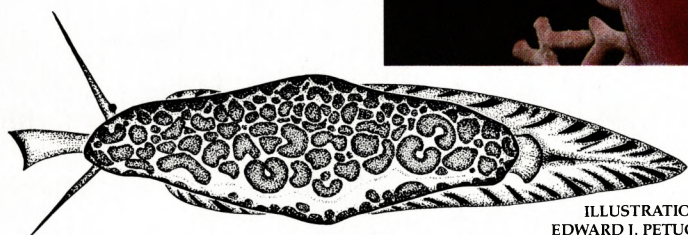


ILLUSTRATION:
EDWARD J. PETUCH

BY BOB WALLACE

Alive, the Flamingo Tongue, *Cyphoma gibbosum*, displays a colorful fleshy mantle, delicately patterned with dark oblong spots, covering a small white or yellowish shell. It is one of the reef's most beautiful small animals.

When taken from the sea, the mantle disappears inside the shell and the animal soon dies.

A few years ago a marine biologist from the University of Miami visited Missouri Key, below Marathon, Florida. In this area between Bahia Honda and the Seven Mile Bridge, he found a rich population of mollusks, including five species of cyphomas, one of which was named for that island, *Cyphoma alleneae*, Cate 1973.

Two years later, the biologist returned to Missouri Key. What he found was discouraging. What he didn't find was the rich population of mollusks. All five species were gone from the area. Hundreds of shells from the dead mollusks were later found in glass jars selling for ten cents each in shell shops. In a few years, the shells fade and are probably discarded.

Undersea photographer/author Bob Wallace's work appears regularly in Sport Diver Magazine.

Although important advances have been made in understanding the Flamingo Tongue, they may come too late to save it from overzealous collectors.

Little is known about the natural history of the Flamingo Tongue. Egg cases were described only about six years ago; yet the first real traceable cyphoma dates back 26 million years into the Miocene Epoch.

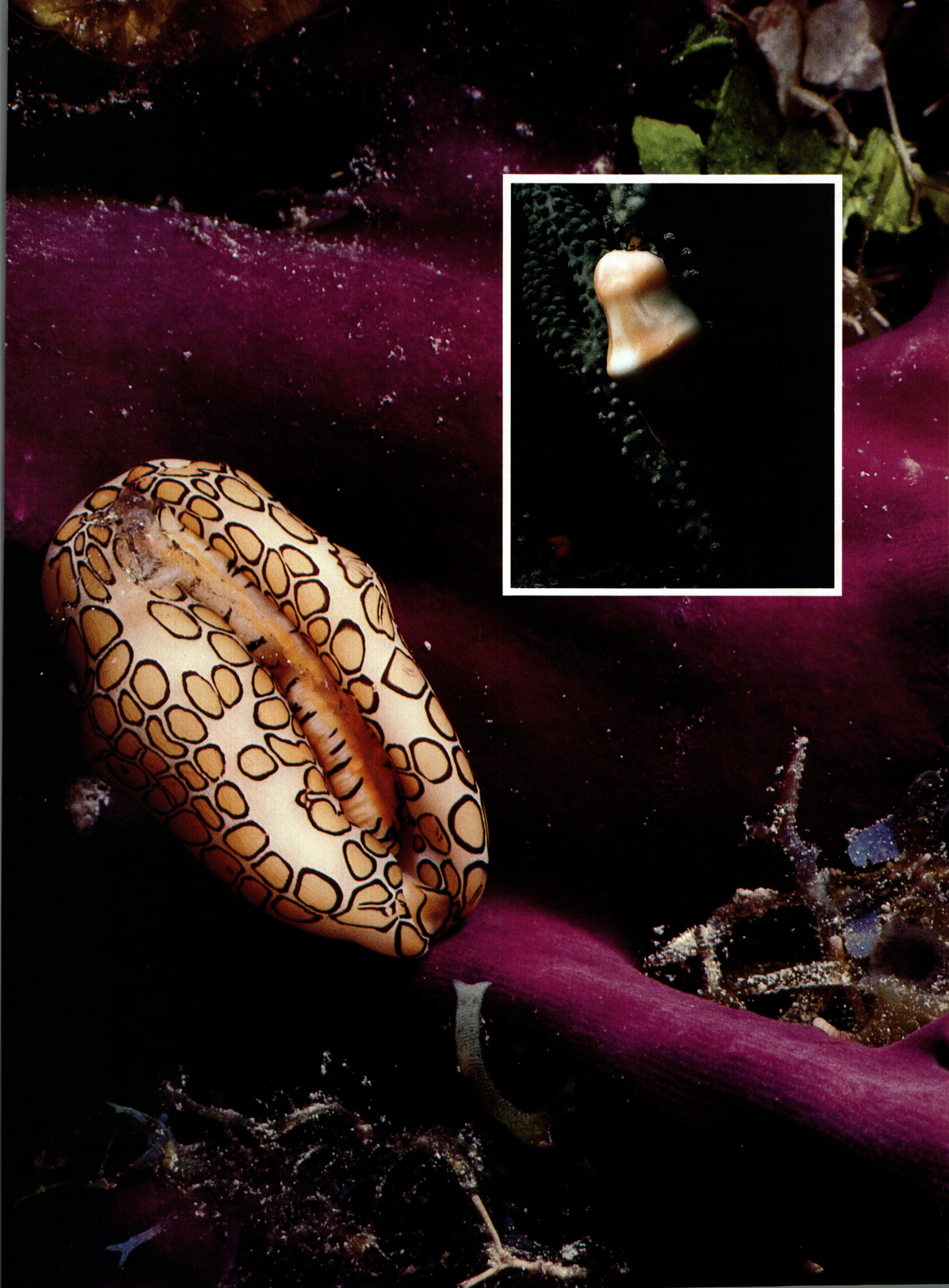
There are now ten known species of cyphomas in the Atlantic. Two or three are deep-water species found at depths between 200 and 500 feet. Three of the six shallow water species are found only in the Florida Keys, making Florida the cyphoma capital of the world.

According to F. G. Walton Smith, President of the International Oceanographic Foundation, collecting seashells and other specimens, either for the pleasure of having a permanent reminder of happy days at the shore or for teaching purposes, is a legitimate objective. However, in a number of densely populated areas, this practice has led to a massive reduction of the natural sea life by wholesale and careless looting of living specimens. When possible, only dead shells should be collected and the live ones should be left undisturbed.

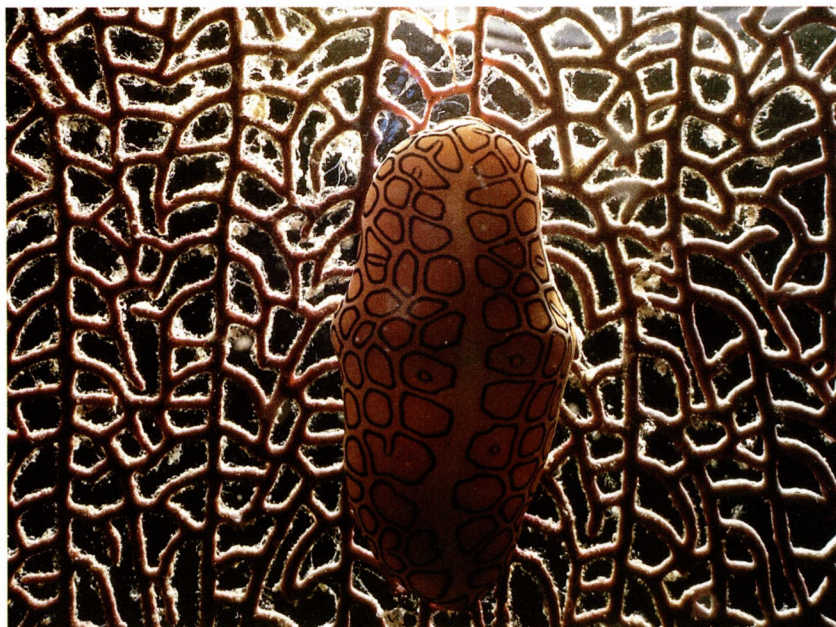
Dr. Smith stresses that individual collectors or classes of school children should be careful to remove only what is necessary and not spoil the pleasure for others who follow them. Some areas,

continued

The common Flamingo Tongue mollusk is not well understood, and this photograph of the mouth of a living Flamingo Tongue (top) is quite rare. The familiar spotted pattern (opposite page) is actually part of the animal's skin, and when the fleshy mantle is retracted (inset), the shell appears a whitish or ivory color.



A few years ago a marine biologist visited Missouri Key...he found five species of Flamingo Tongues. Two years later five species were gone from the area. Hundreds of shells from the dead mollusks were found in shell shops, selling for ten cents each.



The Flamingo Tongue eats the polyps of certain species of sea fans. These polyps (above) form a delicate web that sifts tiny planktonic creatures from the ocean. Composed of protein and covered with plankton, the polyps then make nourishing food for the Flamingo Tongue. The grazing mollusk leaves a path denuded of polyps in its wake (opposite page, bottom), but the sea fan soon regenerates its feeding mechanism and no permanent damage is done.

long famous for the richness of their marine fauna, have become relatively barren, as, for instance, at Sanibel—among others on the Florida coastline.

Cyphoma gibbosum is quite common on the coasts of the Southeastern United States and the West Indies. However, divers attracted by the bright colors are rapidly reducing the species' population.

Researchers admit that incomplete data makes it difficult to attribute the impact of sport divers on a coral reef environment. What we do know is that the Harp Seal, the green turtle, the Blue Whale, the Bald Eagle and the Flamingo Tongue, among other species, have one thing in common: the threat of extinction by a dangerous predator—man.

The search for new knowledge continues as new species are being discovered. The *Cyphoma rhomba*, Cate, 1978, is the newest named species. The animal lives from Fort Lauderdale, Florida south to Key West. It is most common around Sombrero and Pickles Reefs, in Pennekamp State Park, where all sea life is protected. Most species have been observed on the Florida sea fan (*Gorgonia ventalina*). The animal has a clear mantle with purple-red spots and a purple shell. The spots may be for the purpose of breaking up the shell

pattern, allowing it to blend in with the purple sea fan.

The sea fan and sea whip appear to be the only grazing areas for the Flamingo Tongue.

The Pacific genus, *Primovula*, has achieved a higher degree of specialization. Certain individuals are only found on certain species of sea fans. The Atlantic *Cyphoma*, however, is not as specialized. Males and females are often found together as they move from one sea fan to another. As many as 15 to 20 individuals have been observed on large sea fans in the West Indies.

The cyphomas browse along the stem of the sea fan, moving slowly with a suction foot. Although denuded areas are left after grazing, tissues regenerate and the gorgonian does not die.

The Flamingo Tongue is an efficient, specialized feeder and the polyps of the gorgonian seem to be their exclusive diet. Like other mollusks, the Flamingo Tongue has teeth, hundreds of rows of teeth in a ribbon, sometimes as long as the animal. New teeth are produced as old teeth wear out. The radula action is a scraping or rasping movement effective for removing polyps. The teeth are very large for the size of the animal.

Located inside the mantle cavity is

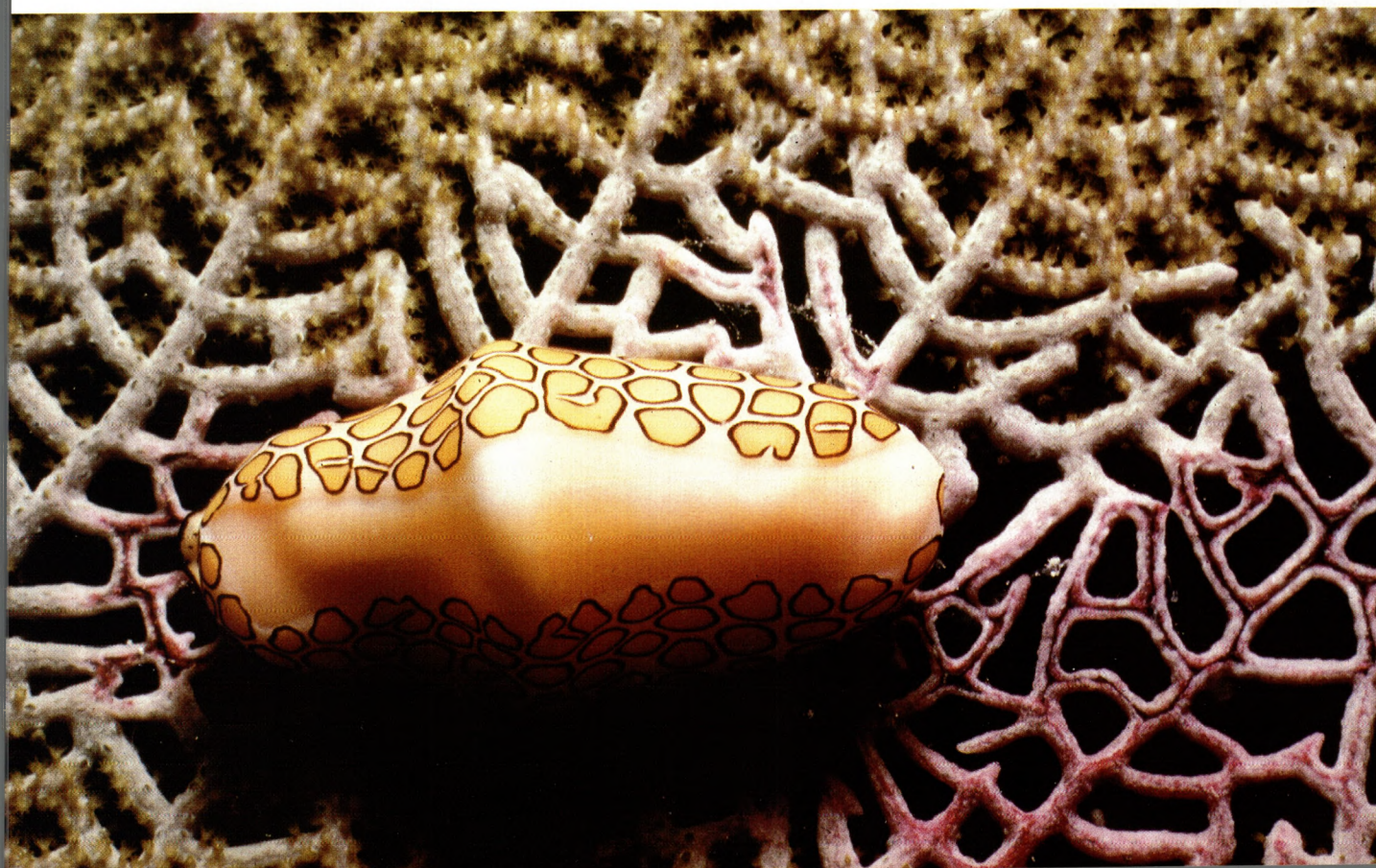
an olfactory mechanism called an osphradium. A stream of water is pumped by muscle contraction and the flow is directed by a siphon over the osphradium, which has chemo-sensitive nerve endings like a snake's tongue.

Reproduction occurs by means of internal fertilization by the male's penis. Small rounded egg capsules, laid in clusters, are deposited in the holes of dead polyps on the sea fans.

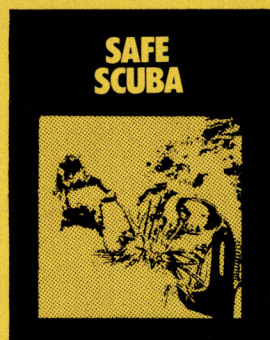
The eggs hatch, usually in the spring, and become free swimming planktonic larvae, about the size of a typewriter period. This swimming stage is known as the veliger stage and occurs in all gastropods. *Cyphoma gibbosum* is more likely to be transported by currents for long distances as opposed to the other species, which retain their free swimming stage within the egg capsule. They hatch out of the capsule as crawling juveniles and their dispersal is limited.

The Flamingo Tongue is a fascinating creature about which there is still much to be learned. The next time you see one, appreciate the beauty of the creature and remind your diving companions, who may have missed this article, that the Flamingo Tongue is most beautiful when it is left in its natural environment—alive.

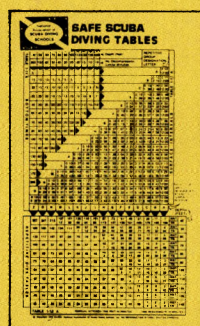




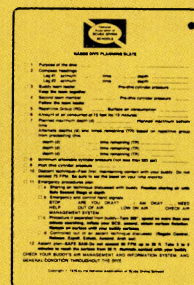
THE NASDS SOLID GOLD



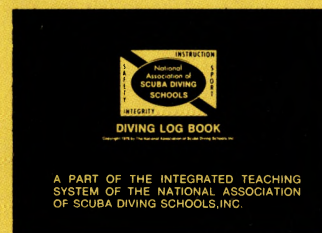
The **Safe Scuba** student text book is a full color text developed by the NASDS Educational Division to educate diving students in the fundamentals of sport diving. Safe Scuba is written in a format that progresses with the diving student from the beginning of their aquatic introduction through the final steps of their basic scuba course.



The **NASDS Safe Dive Tables** are a color coded, simplified version of the U.S. Navy Diving Tables for "no-recompression" dives. The new NASDS Safe Dive Tables have been designed to allow divers to learn, understand, and use dive tables more quickly and efficiently for sport diving purposes. They allow the diver to easily plan the day's dives without confusing computations. The "Time Interval Wheel" on the back of these tables allows the diver a means to assess the amount of time spent out of the water before performing a repetitive dive.



The **NASDS Dive Planning Slate** was developed to aid diving buddies in planning their dives together. On one side of the slate there is a space for recording specific data pertaining to a dive being planned. On the reverse side is a complete "Equipment Systems Check List" which lists all the details a diver should check before entering the water. The slate will fit in the thigh pocket of an environmental protection suit.



The **NASDS Deluxe Log Book** is a necessity for the conscientious diver. The NASDS Log Book is made of waterproof paper with durable plastic covers. It contains areas to record important training data and equipment systems information. It also contains information on the care of diving systems, areas to record individual dives (conditions & locations), favorite dive locations, and a section on basic diver first-aid. The Log Book allows the diver to keep a record of diving experiences and the number of underwater hours accumulated. The Log Book should always travel to the dive site with the diver and should be filled in prior to and following each dive made.

Only the NASDS scuba instruction system offers the educational tools displayed here. NASDS divers use these learning aids to plan their scuba dives like professionals. NASDS store/schools teach the same contemporary scuba course world wide which means you can go into any NASDS store/school and find divers who know how to dive as conscientiously as you. They will be diving with modern equipment like you and they will know the same safety procedures as you. Standard dive-planning procedures, scuba techniques, safety precautions, and diving equipment requirements are taught to all NASDS diving students.

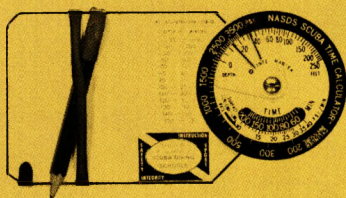
NASDS was the first scuba certification agency to write and develop an organized scuba instruction course. When we named our program, we named it after the instructional manual that all NASDS

instructors use to teach their scuba courses, the Gold Book. We also named it after the text book that all NASDS diving students use, Safe Scuba®. That is why we call our program the "NASDS Solid Gold Safe Scuba® Program".

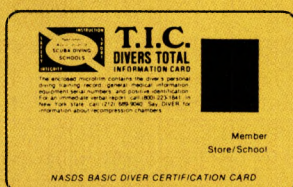
NASDS Offers A High Quality, Controlled Program

The other diving programs can copy our "Solid Gold" concept, but they don't have the high quality, controlled program that NASDS store/schools offer. They don't have the educational learning tools that we offer. They don't have a unified standard course taught the same across the United States, Canada, and other parts of the world. They don't demand exceptionally high standards or ethics from their members like NASDS does.

SAFE SCUBA® PROGRAM



The **NASDS Scuba Time Calculator** is a helpful aid in helping new diving students to learn and evaluate the amount of air they breathe while diving. It is also very useful in dive planning since it allows the diver to compute the amount of air needed for a given dive based upon the diver's known air consumption rate. The Scuba Time Calculator has a built in slate and pencil to figure computations or write messages to one's buddy underwater.



The **NASDS Basic T.I.C.** is the NASDS certification card issued to new NASDS divers who have completed the requirements for Basic scuba instruction. The T.I.C. (Total Information Card) identifies the diver and also carries a micro chip of the diver's original "application for certification" which includes personal identification, counseling information, general medical information, training data, and equipment serial numbers.



The **NASDS Open Water T.I.C.** is the NASDS certification card issued to divers who have had scuba training in the open water beyond the requirements of Basic scuba classes.



The **Captain Scuba Neckpiece** and T.I.C. micro chip are part of the Total Information Card program. An extra micro chip accompanies each NASDS T.I.C. (Basic & Open Water). NASDS has designed a divers neckpiece that will carry the extra micro chip while the diver is on the beach or in the water where a wallet can not be taken. The micro chip identifies the diver, gives their address, emergency phone numbers, and a brief medical information sketch that can assist medical personnel in the event of an accident or unconsciousness. The micro chip can be read by hospital microviewers or even a 5x magnifying glass held up to a light source in emergencies. The neckpiece is available in navy brass, silver, or 10kt. gold from NASDS stores or from National Headquarters in Long Beach, California.



The **NASDS Safe Plug** is a device used by divers to keep the "Safe Second Stage" of an air delivery system positioned in front of them during dives for easy access. The Safe Plug fits snugly in the mouthpiece of regulator second stages. It can be used to plug the mouthpiece of the air delivery system while the system is in storage to prevent foreign particles or insects from lodging inside.

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Like fools gold, they may sparkle of high quality, but when it comes to value... only the real thing passes examination. Only NASDS offers the real original "Solid Gold Safe Scuba® Program".

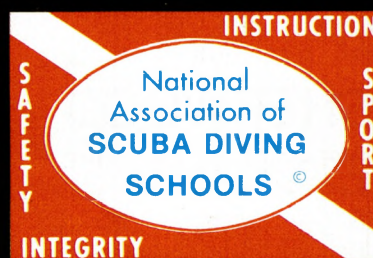
250 select scuba store/schools belong to the National Association of Scuba Diving Schools (NASDS). Only the best become NASDS. Membership lists are available by contacting NASDS Headquarters at P.O. Box 17067, Long Beach, CA 90807. (213) 595-5361.

NASDS Diving Instructors College

NASDS also operates a Diving Instructors Vocational College in San Diego, California. It is approved for V.A. benefits and by the state of California. At the

Diving Instructors College certified divers are trained to become qualified professional scuba instructors. For information about the college, please contact the NASDS Diving Instructors College, 4004 Sports Arena Blvd., San Diego, CA 92110 (714) 224-3228.

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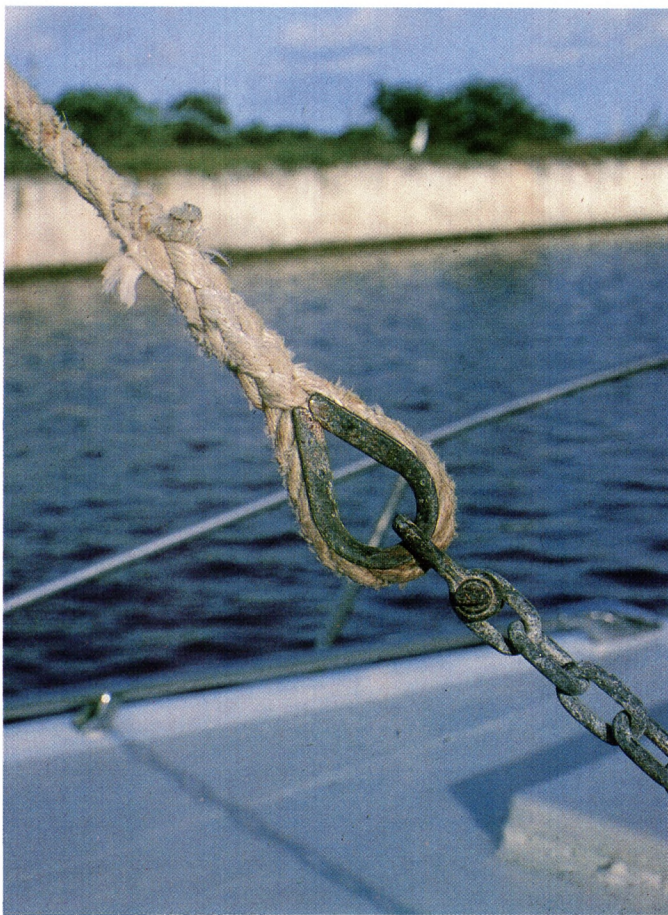
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The anchor should be attached to a chain, and the anchor line to the chain by means of a metal line protector.

BY STEVE BLOUNT
PHOTOGRAPHY BY STEPHEN FRINK

Basic Instruction:

Rig Your Boat for Open-Water Diving

Diving from your own boat is easy and fun—but only if you do it right.



There are a number of well-designed boats available for divers, but unlike the complete-down-to-the-brass-bar-rail models made for fishermen, there are very few you can trailer off the lot direct to your favorite offshore dive site. Modifications and additions are going to be necessary if you want safe and hassle-free diving.

After buying a suitable hull, you'll add the equipment to make it a first class open water dive boat. Some pieces of gear are available as options from the manufacturer, others you'll have to find or build.

The Engine

The engine you choose will affect the range, performance, cost and maintenance requirements of your boat. An outboard will suffice for boats 26 feet or less, inboard-outboards for boats to 28 feet. Over 28 feet, you should consider an inboard essential. While gas engines are practical on smaller boats, less than

35 feet, a diesel engine will be safer, more reliable and cheaper to run. The catch is that installing the diesel will cost approximately five times more than installation of a comparable inboard-drive gas power plant.

Naturally, if your budget allows, dual engines are most desirable. But engines are expensive, so if you end up with a single engine you should never leave port without spare parts.

Spare Parts You Should Carry

If you run offshore, a relatively complete spare parts inventory is necessary. The rule is to carry a replacement for anything you think can't screw up. This may sound awfully inclusive—it was meant to. A night spent riding the Gulf Stream halfway to Bermuda or even a few embarrassing hours waiting for the Coast Guard will eventually convince the most daring skeptic. Always carry an extra prop, oil, ignition parts, belts, alternator, drive shaft, struts, cooling hoses, and a water pump impeller or, better yet, a complete pump.

You should have two or more batteries. In a twin-engine installation, wire them so either engine can be started from either battery, and both batteries can be used to start either engine.

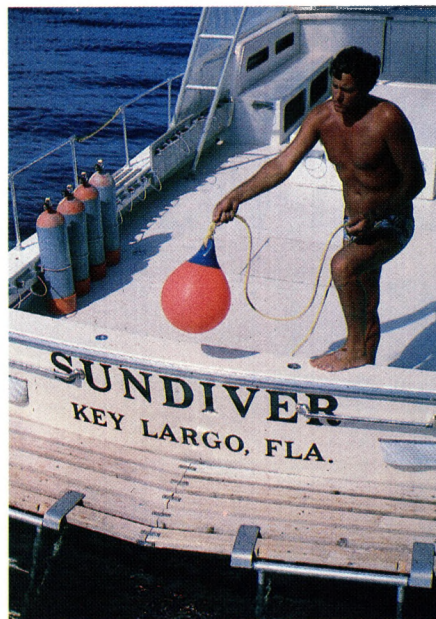
Tools

You'll need tools to install those extra parts, so carry a full set of wrenches, both socket and box end; crescent wrenches; screwdrivers; hose clamps; gasket material and sealer; duct tape; tie wire; an assortment of nuts, bolts, nails and screws; electric wire, and cotter pins. Carry some wooden plugs of different sizes and some rags. These will come in handy should a through-hull fitting come loose or an uncharted rock throw itself in your path. And don't forget a hammer to pound the plugs in with. Marine Tex two-part epoxy is just about the last word in bonding for anything from patching an engine manifold to glueing your buddy to the deck.

Electronics

Sometime during your experiences as an offshore skipper you'll want to com-

continued



A trailing line with a buoy large enough to float a diver should be positioned downcurrent whenever there are divers in the water. Getting in and out is a lot easier from a platform. Key Largo skipper Tom Guarino built his own using extruded aluminum tubing.

municate with other boats or shore—desperately. A VHF marine band radio is just as important as fuel. Continuous weather updates from the National Weather Service can be monitored as well as hourly Coast Guard weather updates. These broadcasts can help you stay out of heavy weather and nothing more than an easily-obtained FCC Restricted Radio License is required for VHF operation.

Citizen's Band Radios are useful, as are the more expensive single side band radios in the two to 12 megahertz band. The FCC requires a VHF be aboard before a single side band set is installed, and a back-up VHF is more important than the single side band.

You may want to install a depth recorder, or a Loran. The depth recorder will help you locate wrecks, reefs, and drop offs and can be used as a general navigation aid. They are relatively inexpensive for the degree of detailed information they provide for finding sites and dive planning.

Loran (Long Range Aid to Navigation) is the most accurate means of plotting locations and finding sites, particularly in an area where it's difficult to

get land ranges. The new Loran-C can put you within 50 feet of your target anytime of the day or night, in the densest fog. The drawback is that it costs around \$4,000, and installation will run you an extra \$150. The older Loran-A costs less—\$1400 plus \$150 installation—but is less accurate, finding spots only to the nearest 500 feet.

The Anchor

The anchor is a vital piece of safety equipment and it should be selected with care and forethought. An anchor that is easy to haul up but too light for the craft it's holding can lead to sorrow. Many a diving boat owner has surfaced at the last known location of his pride and joy, discovered it missing, and spent months cursing "that friggin' anchor." The proper size and type of anchor, properly set, is cheap insurance indeed.

The right anchor for your boat will depend on the size of the craft and type of bottom in your area. A marine supplier will be able to give you specific advice on the type of anchor you'll need for your area.

The anchor should be connected to

a chain, and the chain secured to the anchor line. The chain will prevent sharp coral or a piece of debris from severing the line.

The anchor line should be nylon, not polypropylene. Nylon will give and stretch a little. Also, this should be obvious, but don't forget to tie the anchor line to the boat. You've probably noticed there are more anchors underwater than sunken boats. Now you know why.

Your anchor line should be five to seven times the depth of the water you expect to anchor in. When you do get ready to anchor up, please look for a sandy place and don't throw that huge hunk of iron on a reef. There's nothing uglier than a world-champion stand of coral that's missing a big chunk from a dragging or misplaced anchor. If you can't see the bottom, use your depth recorder, it should give you an idea of what's down there.

Trail Lines

While you're rigging your anchor line, buy a hundred feet of high-visibility polypropylene line. Attach a large float to the line, big enough to support a



Electronics should be within reach while you are at the wheel, and backups, such as the two depth recorders (center and right in photo above) are crucial. In addition to up-to-date charts, Capt. Guarino and First Mate Jan use a variety of navigation aids, including an RDF.



diver. The float and line should be let out behind the boat (downwind or downcurrent) anytime there are divers in the water. Should someone come up behind the boat or be caught downcurrent, they can hang onto the float while you haul them in. The line and float also serve as a sort of barrier for other boats. When they see this large float a hundred feet behind you, they tend to steer a wider path around.

Divers Down Flag

Federal and state laws require that you fly the red and white divers down flag while divers are in the water. The flag warns other boaters to steer clear, so a large flag prominently displayed is in your best interest.

Recently there has been some confusion among boating divers over the supposed adoption by the Coast Guard of the international divers flag. The blue and white swallow-tailed pennant was not authorized as a replacement for the current flag. The Coast Guard only agreed to recognize the international signal when flown in U.S. waters by vessels of foreign registry.

Equipment Storage

You'll need a place to store diving equipment on board. Tanks in particular can be hazardous if they get loose while underway. Nobody enjoys getting banged in the shin by a steel 95 so piling them on the deck is out. Two popular solutions are to buy a floor rack or install side racks.

Floor racks are usually portable and made of steel. They work well but take up a lot of deck space.

Side racks can be built by scalloping two pieces of 2 x 12 and installing them just below the gunnels. Elastic bunji cords can be used to hold the tanks against the rack.

Platforms

There are many advantages to having a dive platform. You'll have more room to gear up as divers ready to go step out onto the platform. It makes getting in and out of the water a great deal easier, especially if you're carrying a camera or goodie bag.

The platform shouldn't drag while underway, and it should be installed so it won't damage the transom when

divers stand on it. It should be positioned so you can step over the transom and onto the platform easily. This may necessitate cutting down the transom a few inches, especially on larger boats with a high freeboard.

The ladder should allow you to climb up with fins still on, so the rungs will have to be farther apart than normal. Commercially built ladders generally won't cut it. Usually they fall against the side of the boat, forcing divers to climb up a 45° incline with full gear. Build your own ladder. It will work better. If you must buy one at least brace it so it will stand away from the side of the boat.

If you're really handy consider building your own platform. Aluminum tubing, called Speedrail, can be purchased from an aluminum supply house with pre-cast fittings for corners and hull connections. Aluminum fencing rail will also work well. For a boat less than 30 feet, $\frac{3}{4}$ " pipe will do nicely, and this can be bent to shape using an ordinary vise and a lot of caution. For larger boats use 1" to 1½" pipe. You won't be able to bend

continued



Tanks must be kept still while underway, and rubber tank holders, like the commercially available model above, a homebuilt scalloped rack (right), or a floor rack should be installed.



this pipe but your local muffler shop should have hydraulic benders that will do the job quickly.

Once you've constructed the frame, floor it with fir or teak. Teak will last longest and looks best. Fir holds up well and is infinitely cheaper.

Bilge Pumps

Although the Coast Guard doesn't require bilge pumps you should carry two high capacity pumps, particularly if the boat doesn't have a self-draining cockpit. The pumps can be electric, engine-driven or manual. A mixture of types is best, and at least one should be manual.

Fire Extinguisher

The number of fire extinguishers will depend on the size of the boat, but one in the engine compartment or by the outboards and one in the cockpit is the minimum.

Illumination

Besides the navigation and running lights the Coast Guard requires, you'll need general deck illumination. Cyalume chemical light wands are good for this

purpose if you don't run at night a lot. For a night dive, put a Cyalume inside a milk jug and tie it about ten feet down the anchor line. The jug will diffuse the light and give the divers a bigger reference point.

First Aid

First class first aid equipment should be handy at all times. Buy a complete ship's first aid kit, then add a first aid manual; Adolph's Meat Tenderizer or Dacor's Sea Sting Solution; antihistamine tablets; Bonine or Dramamine motion sickness tablets; something to ease pain; and a dangerous marine life identification book. A small oxygen bottle and mask can be had fairly cheaply and could, literally, be a life saver.

Navigation

Invest in a good set of charts for the areas you'll be diving. They'll tell you where to look for good sites and how to avoid hitting some of the less obvious hazards-to-navigation such as submerged shoals, rocks and shipwrecks. A book on general navigation techniques won't hurt either.

Education

The most important piece of equipment on an offshore dive boat is the skipper. If he is skilled, knowledgeable and careful, the dive trips will be safe and enjoyable. The Coast Guard offers powerboat courses that will inculcate the novice with the ways of the ocean and bring the rusty old salt up to a proper level of proficiency.

They'll give you a lot of useful tips, but perhaps the most important things you can learn are respect—and due caution.

Be careful in your boating as in your diving. Keep up with the weather and be prepared to abort a trip if conditions warrant. A good skipper knows his boat and his own limitations.

And respect your aqueous playground. The ocean belongs to every one—perhaps more than that it belongs to the future. Your responsibility is to use it for pleasure while preserving its beauty and inhabitants. Careful anchoring and general cleanliness will take care of 90 per cent of our boat related sins. Good manners and your conscience should prevent the others.

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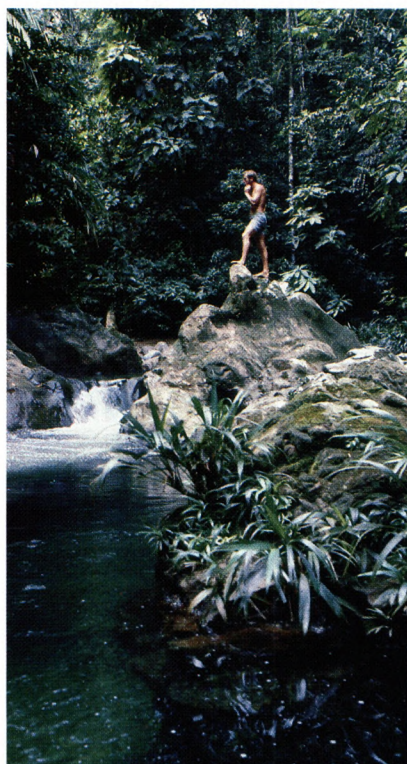
BY PHILIP TRUPP
PHOTOGRAPHY BY
NED DeLOACH

Tom Moody settled into a wicker chair, fondled a snifter of brandy, and invited us to share with him a view which must have thrilled him endlessly. In this remote and sheltered corner of the Caribbean we gazed at the sweep of the Panamanian coastline. Mountains soared out of the Darien jungle and disappeared into a soft covering of clouds.

Tom sipped his brandy, lost in private thoughts. We could not guess at them. Who can know what thoughts possess a man who, at the tender age of 50, has realized his most ardent ambition. Many have dreamed of having their own island paradise. But Tom Moody, by persistence and will, had made the dream come true. Now he was master of Pidertupo Village.

Pidertupo (Bean Island) is one of hundreds of jewel-like islands which form the San Blas Archipelago. These tiny spits of sand decorate the Atlantic coast of Panama to the borders of neighboring Colombia. Pidertupo was

Contributing Editor Philip Trupp has been begging for a Caribbean assignment—or anything to get him out of Washington. Photographer Ned DeLoach says he almost didn't come back from this one.



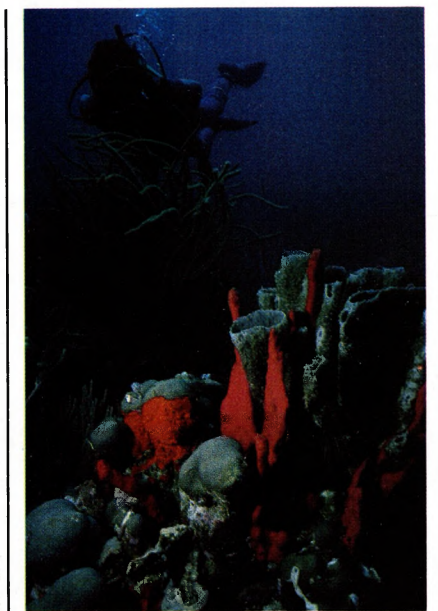
The San Blas' Cuna Indians make bright molas for sale or for their own clothing. The bright designs depict events and creatures from the mythology of the Cunas. Mountains and high waterfalls of the Darien jungle on the mainland (above) contrast sharply with the flat topography of the San Blas.

more or less typical: an acre and a half of sand and fruitful coconut palms. It had been obtained by Tom on a long-term lease from the Cuna Indians. Until he arrived a few years ago, the Cunas would allow no outsiders on any of the 368 islands which are their homeland. Officials of the Panamanian government had dismissed the possibility of his ever breaking through the cultural barrier which stood between the Cunas and the rest of the world. His discovery of a renegade Cuna willing to lease Pidertupo was nothing short of miraculous good luck.

It is also good luck to that special breed of sport diver who is drawn to truly out of the way places. Pidertupo would be no fun at all to those hordes of divers which descend on the "tourist" islands of the Caribbean. They seem to thrive on hustle and package deals. They would be restless at Pidertupo Village where good manners and bright conversation are at least as valuable as a C-card.

"I know this place isn't for everybody," Tom said. "But I'll tell you this—I'm not here to make a fortune. I mean, what the hell. If you don't make a million by the time you're thirty-five you may as well relax and enjoy yourself."

continued



Sponges with almost impossibly intense colors may be found along any of San Blas' reefs (left). Fire coral is also fairly common along the many drop offs.

He strolled onto the veranda. The tropical afternoon was still, the sea so calm that it seemed we could walk on it.

"I love it," he said. "It's my home. My island. Once in a while people come to visit. Most of them are old friends."

Two of these old friends were there at the time. Bob and Barbara Hobert of Ft. Lauderdale were on their seventh visit to Pidertupo. They were divers, but that alone didn't explain their repeated visits. Like so many others who had found Pidertupo, they wanted to get away from it all—*really* get away. The village is about as far away as one can get in this mechanistic hemisphere. Shoes were considered showy and unnecessary; electricity and phones didn't exist; clocks were a nuisance; guests who stayed in the graceful thatched bohios found a written request that they take only one cold water "sailor's shower" a day.

"Not everyone is going to enjoy this sort of life," Bob said. "But after you've been around a bit you realize how special it is."

Certainly Tom understood this. After decades of drifting through the Caribbean with his wife Joan and their daughter Marijo, he had acquired that strangely distinguished title, "old Caribbean hand." It meant he had been general cook and bottle washer, fishing captain, wireless operator, doctor, lawyer, Cuna Indian chief and scuba guide. To this he added his own definition: "It means you're a little nuts."

It was a cheerful statement from a man who in a former life had given up

ownership of a miniature golf course in Pennsylvania to pursue what many would consider an impossible dream.

That pursuit hadn't dimmed his enthusiasm for diving. It was infectious. Experienced divers will understand Tom's diving style: he wears mask, fins, tank and regulator—that's all. If a visitor owns gauges, BCs and other safety aides, Tom encourages their use. But it is vain to attempt to change Tom's style.

If Tom is inclined to lyricism when describing his special part of the world, he is also effusive about the underwater terrain: "I think it's as beautiful and varied as any I've encountered in the Caribbean."

It didn't take us long to discover that Tom wasn't exaggerating.

The reefs off any of the hundreds of islands surrounding Pidertupo are fun to dive. Generally, the fringe reefs just off the islands are from five to 15 feet deep and offer excellent snorkeling for those who don't use compressed air. But further out the reefs fall off abruptly, dropping to the sea bed 100-135 feet below. The diver can just about choose the depth.

The San Blas island group reminded us a bit of the Bahama Banks. There were no bottomless drop-offs, and shallow water offered endless color and life. Basically, the diving was relaxed and the water quite warm, about 80 degrees. We dove out of Tom's 30-foot twin-diesel Bertram. He trailed a dinghy for use as a pickup boat which followed our bubbles. We didn't have to gauge underwater time for a return swim, since the

dinghy was always above us.

The best diving is during the rainy season, from April to October, when the northeast winds let up and the sea is usually smooth. During our visit in September the ocean was so calm and transparent that we might have been cruising over a lake in a glass-bottom boat. I had never seen the sea so amenable, and I remarked to Tom that I hoped our luck would hold.

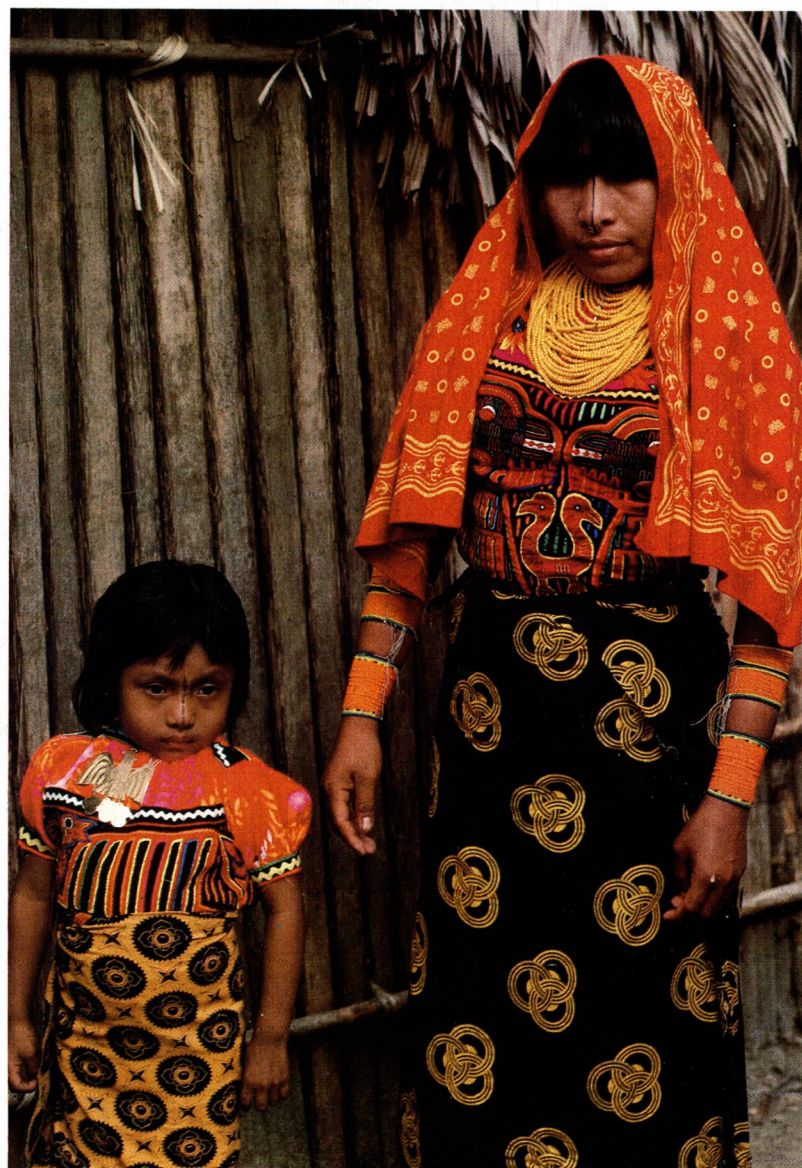
"It will," he said. "This is typical. It's fantastic, isn't it? Perfect conditions almost every day."

That term, "rainy season," has an ominous tone. But in the San Blas it simply means that a gentle shower drifts in from the mainland during the afternoon and lasts an hour or so. It is a refreshing interlude. During the few strong blows of winter, diving is shifted to the leeward sides of the islands. But there are only a few days in the year when diving is impractical. Between December and March the northeast trade winds blow, limiting diving activities on the north sides of the reef, which have the prettiest coral formations.

Because they are part of a long, shallow bank which at one time must have been above sea level, the San Blas Islands do not offer spectacular underwater visibility. The bottom is a bit dark and there is particulate matter in suspension. But a bad day would still give us 40 to 50 feet of horizontal visibility; typical days offered 80 to 100 feet. Even on those infrequent low visibility days, the view is enough to spoil most divers.

Tom makes a point of telling guests

continued



Soledad, a Cuna village, crowds the shore of the tiny island on which it stands (above left). Cunas, who maintain pure blood lines, throng the narrow paths among the huts, draped liberally with 14 karat gold ornaments.



his resort isn't especially geared to diving. He owns reliable compressors and about 24 scuba tanks. He provides backpack, tank, air, weights and weightbelts. Also available is a selection of fins and masks. Visitors must bring their own regulators and BCs.

Tom doesn't teach scuba. He feels that to attempt to learn this complex skill while on a short vacation is not only foolish but extremely dangerous. And, one suspects, Tom simply doesn't want to be bothered with the intricacies of explaining buoyancy control and Boyle's law.

He takes out the boat nearly every day but seldom dives more than two tanks. If guests want more bottom time, they may explore the good reefs just off Pidertupo. This can be great fun. A swim to the reef is easy, and divers are free to catch lobsters and tiny "Anka," a lobster-like creature which, if anything, has a more delicate flavor. You can bag your own dinner anytime—provided you share it with the other guests.

On our first day we cruised to a section of the outer reef line located about a half hour from the resort. The lip of the reef started in 50 feet of water and dropped almost vertically to 110 feet. Its face was cut with deep crevasses, gullies, and coral caves. There was a vivid pattern of form and color. Feathery serpulid worms decorated the wide coral plates in clusters; tiny tropical fish darted busily in



The Buena Ventura has found a permanent home near Pidertupo Village. The wrecked freighter was supposedly smuggling platinum and drugs when it sank. The cargo was salvaged by the Cunas and sold back to the company who insured the boat.

and out of the growth, adding another splash of color to the reef. However, we didn't see any really big fish. Only one barracuda was spotted, and no sharks. In fact, the underwater scene was nothing at all like what was described in an edition of the *International Divers' Guide*, which told us visibility was unlimited and big predators were always present.

Good diving locations around Pidertupo are abundant. We didn't explore the same section of reef twice during an entire week of diving. Most of the reefs have gradually built up on the island "walls," as Tom calls them. These walls are generally shallow, bottoming at about 100 feet, and bear only passing resemblance to those dizzy drop-offs around islands such as Grand Cayman. The walls vary little in construction from island to island. For variety, we dove the patch reef on the sand flats between the islands where depth is from five to 30 feet and there is a remarkable increase in horizontal visibility, to perhaps 100 feet or more.

It was on one of these patch reefs that we discovered one of the most remarkable wrecks in the Caribbean. The 105-foot *Buena Ventura* is a match even for the famous *Rhone* of the British Virgin Islands. Some divers believe it's better because it's shallow (she rests in only 20 feet of water) and, except for the superstructure, is in near-mint condition.

The *Buena Ventura* was scuttled 18

years ago. She was carrying contraband: platinum hidden in bronze bars, and opium. Both have long since been removed. The area around the wreck is littered with small brown bottles, which Tom says may have been used for the drugs. Divers are invited to take a few as souvenirs. He told us that Panamanian divers came from the mainland to strip the wreck, but they met with violence and death at the hands of the Cunas. The Indian free-divers waited until the Panamanians were grouped inside the aft compartments and then slammed the doors shut, trapping them inside. The Indians then salvaged the bronze bars, which were later repurchased by an insurance agent who never let on that each contained a strip of pure platinum.

Today, the steel frame of the *Buena Ventura* has been transformed into a wild garden of marine growth. The scene is one of floating beside a huge abstract painting by Jackson Pollack, with details by the venerable Salvador Dali. A big funnel lies beside the wreck, supporting an incredible profusion of sponges which run the spectrum of chromatic possibilities. Few wrecks in the Caribbean can boast such a diverse display. The slight current provides a constant supply of nutriment for the creatures which are established on the hull.

Later, we swam away from the vessel to a long, flat bed of elkhorn coral which spread out along the bottom like a three-dimensional collage. Not 50 yards from the wreck, the coral wall of the island descended to 90 feet. This tiny niche of the Caribbean between two small islands would in itself be worth a trip to the San Blas.

"You can make the dive into anything you want it to be," Tom said. "It's up to you."

This, too, was an unusual feature. Too often resort guides play at being squad leaders who expect divers to follow them in lock-step. Such conformity is non-existent in Tom Moody's world. He assumes you know what you're doing and merely points you in the right direction. You can follow him or choose your own course. There are no stern lectures about sticking with the "guide," none of the outlandish paranoia which sometimes characterizes "cattle boat" operations. In the San Blas you are free.

We spent the morning of each day diving our two tanks. This allowed us plenty of time in the afternoon to relax and enjoy the good company. Pidertupo Village is a perfect setting for the little amenities of civilized existence. Its thatched bohios are tiny art galleries

bright with native Cuna art, and the big guest house provides a collection of first editions unequalled in this part of the world. Conversation sometimes runs to diving, but more often it demands wit and humor. One evening we listened to a tape-recorded routine by a South African comic, a kind of Lennie Bruce of the Bush. On another occasion we rambled over politics, art and the much-misunderstood controversy surrounding the Panama Canal. (It seems the Panamanians really didn't want it, since it was losing millions of dollars annually. The Carter Administration was apparently "dumping" it in hopes of getting out from under the liabilities.) One could get by as a good diver, but it helped to maintain the cultural ethic built up over the years by visitors from all over the world. Tom Moody considered himself something of a Renaissance man, and he encouraged his guests to display their best repartee.

A short distance from Pidertupo are dozens of islands with deserted strands of beaches waiting for shell collectors or those who enjoy a rare opportunity to be truly alone with the sea.

"I'd sure like to spend some time out there with a loving friend," photographer Ned DeLoach confided. It was a natural impulse; the setting almost demanded a romantic turn of mind. As a former visitor once said about the San Blas: "You'll love it if you're alone. But you'll be *mad* about it if you're with someone you love."

On the fourth day, we visited the Indian island settlement of Soledad. The Cunas are the second smallest race of people on earth (African Pygmies are the first), but they are the single wealthiest culture in Latin America. The San Blas islands are home to 30,000 Cunas who were driven from the mainland centuries ago by Spanish conquerors. They have maintained a pure blood line. A Cuna simply doesn't marry an outsider. The penalty is expulsion. Their society is a tightly bound matriarchy, and its ways are as fiercely exclusive as their huge holdings in the Bank of Panama—holdings built on coconuts and 14-karat gold. If you have never experienced "gold fever," you are in for a good dose of it at Soledad. The Cuna women, dressed in their native applique blouses called *molas*, which are collectors' items, have no self-consciousness about covering themselves with gold. Even infants are draped liberally with golden chains and ornamental jewelry. It is enough to make your head spin.

Through the years, the Cunas have fought bitterly to repel outside influ-

ence which threatened their independence. Tom told us they totally defeated a horde of Panamanian soldiers sent to take the islands in the 1920s.

"They're rugged fighters," Tom said. "Little, but damned tough." Tom had mastered all the diplomacy necessary to move in Cuna society with easy assurance, and he had a great admiration for the Indians. Like him, they were individualists, at once removed from the mainstream of modern civilization, and yet very much aware of its influences. Tom trusted the Cunas, and, considering he was a "gringo," they seemed to trust and accept his presence among them. Besides, he brought visitors to Soledad, visitors who had "Yonkee" cash to spend on native arts and crafts.

When we stepped out of the boat and onto the village dock, we were instantly surrounded by dozens of boisterous children. It was a scene out of Frank Buck. The elderly chief of the village, a tiny leather strip of a man called Charlie, had for a time been a seaman aboard an American merchant vessel. Charlie slowly ambled through the wash of youngsters and greeted us in broken but clear English.

We made our way through the narrow passages between lines of thatched huts packed as tightly as brownstones in Greenwich Village. And the place was alive with Cunas: unending streams of children, quiet steady men, and women holding up to our inspection more examples of mola art than might have been altogether reasonable. Even though each was eager to make a sale, they never forced themselves into a hard sell. If we shook our heads "no" to a particular offering, they politely stepped aside and allowed the next mola-maker to display her wares.

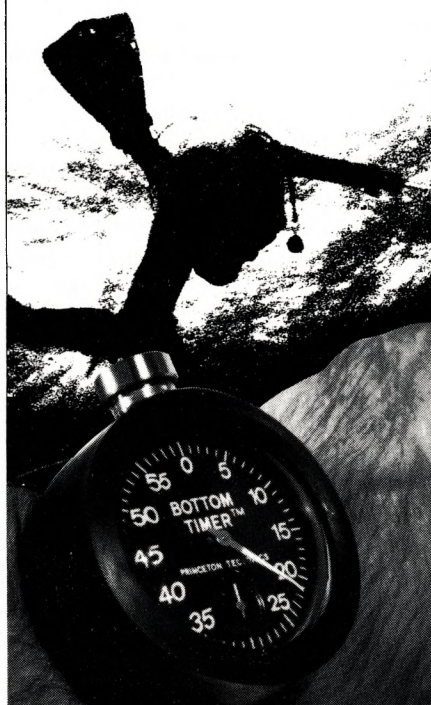
We tried to take photographs, but the camera put them on edge. Tom explained that the Cunas weren't overly fond of photographers: "They feel they're being exploited." But we had an ace in the hole. The young couple accompanying us carried a Polaroid. Its effect was instant magic. Those 60-second snapshots were the hit of the day. The shy women disappeared into their huts and reappeared wearing their finest ornamental garb. Gold sparkled in the afternoon sunlight. While the Polaroid snapped off dozens of pictures, Ned fired away with his Nikon.

Our last day at Pidertupo was set aside for a trip to the mainland. We were to follow a river into the jungle, then go by foot across virgin territory and up a series of three beautiful waterfalls.

Tom carefully guided our boat into

continued

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SAN BLAS *continued*

the shallow estuary and headed upstream for a few hundred yards. Where the river became impassable we jumped onto the river bank and headed into the bush.

Pidertupo had no annoying insects, but the Darien, which had never been penetrated and had halted construction of the Pan-American Highway, more than made up for it. It seemed that everything wanted to eat everything else. Big black flies zoomed in, digging into an exposed patch of skin and biting until the victim bled. "The only way to get rid of them is to kill them—like this," Tom said, snatching one of the little monsters from his forearm and crushing it quickly between his fingers.

The trail led upwards. We passed the thatch-covered burial grounds of a Cuna family. A child was buried in one of the graves, and above the mound the child's playthings hung on a string. There was a doll with strange, staring eyes. Ned's Nikon clicked.

"Did that grave bother you?" Tom asked.

"A little," I said.

"I don't know why. It's a lot more civilized than those awful things you find in the States. When I go, I want to be buried here.

The canopy of the rain forest closed overhead. Now the ambience was dark and cool. I had always imagined a jungle to be unrelentingly hot. The slight chill surprised me. We came to a patch of cashew trees. Tom plucked one of the nuts and held it up so that we might examine it.

"Deadly poison," he said. "The Indians use the oil on their spear tips. To eat them you've got to boil out the oil. Think about that next time you dip into a nut tray."

We waded across a stream. It was intensely cold. Hundreds of small gray fishes nibbled at us. If they weren't the piranhas of South America, they were the next-best thing. Their appetites were no less unsatiable even if they didn't have the razor-sharp jaws to back it up.

We followed the watercourse for another ten minutes before coming to the first set of falls. The white water contrasted sharply with the dark river. A deep pool filled by the cascade was inviting after the difficult hike. We had a relaxing swim before continuing upwards toward the last set of falls.

"From this point on it's all virgin jungle," Tom said. "Not even the Indians come here." A few moments later he turned and indicated that we were

to remain absolutely still. Farther down the river bank, unaware of our presence, a medicine man was gathering the basics of his potions.

"He's the only one who comes up this far," Tom whispered. "The Indians consider this a holy mountain. You don't come here unless you belong, like him."

The medicine man continued his gathering. Ned's camera shutter snapped open and shut. I had the feeling he sensed us. But it wasn't worth his time to stop gathering to pay attention to these silly white fools. The medicine man had better things to do.

After much swimming and climbing, we reached the third falls. The afternoon was perfectly silent.

We turned back when the rain started. At first it was a drizzle, then a steady downpour. The downpour soon became a blinding screen of water.

"Faster," Tom commanded. "It's been known to flood up here. Once a ten-foot wall of water hit without any warning. Let's move it!"

Never in the history of San Blas did a party of gringos move so quickly (if somewhat clumsily) through that dense bush. We passed the grave site we had seen on the way up. Now, through the gray haze of rain it took on an eerie, prophetic cast. Ned slipped under the thatch roof and focused his camera.

"Come on," I shouted over the din of rain. "We won't even have the satisfaction of being a statistic if we don't get out of here."

Ned, photographer to his fingertips, snapped off a half-dozen shots, then checked for another angle.

That evening we sat on the veranda and looked out over the darkly shining Caribbean. The moonless sky was white with stars. In the distance a big cruise ship had anchored in the lee of a distant island. We could see the ship's lights blinking like a small galaxy that had come to visit the sea. I imagined the passengers laughing and dancing to a fashionable beat. If they were absorbed in themselves, they could not know that, viewed from the vantage of Pidertupo, they and their huge vessel were almost lost in the vastness of the San Blas. A slight breeze passed over the surface of the sea; the nuctilluca shimmered vibrantly. In the jungle the toys hanging above a child's grave swung for a moment, then stopped. These things would be here centuries from now.

Time has been merciful to the San Blas. It has suspended its wanderings, and it has bestowed a mysterious peace. It has gone about its never-ending business, unmindful of this universe.



SAN BLAS ISLANDS

GENERAL

Location: 1100 miles south of Miami and 200 miles west of Cartagena, Colombia
 Size: 1 square mile
 Topography: a flat island with sloping beaches
 Climate: tropical with 60 inches of precipitation annually
 Population: 10
 Largest towns: capital Panama City
 Languages: Spanish, Cuna dialect
 Ethnic composition: 99% Indian; 1% Other
 Economy: 85% agricultural, 15% tourism
 Monetary unit: One Balboa = \$1.00 US
 Diving season: May-October
 Tourist season: Dec-March

DIVING

Water temperature: winter 75-85°, summer 75-85° F
 Visibility: 50-60 feet, rainy season May-Oct reduces visibility to 40-50 feet
 Depth of dives: 5-140 feet
 Currents: none
 Tidal fall: 3 inches
 Types of diving: reef, wreck, wall, night, beach
 Skill level: novice, intermediate, advanced
 Dives per day: 2
 Diving craft: good
 Sights:

Fish: large variety of tropicals, but few large fish or gamefish
 Coral: plate coral, staghorn, antler coral
 Sponges: small in size, but very colorful
 Invertebrates: serpulids, sea plumes, rock lobster, banded shrimp, arrow crabs

Restrictions: none

DIVING SERVICES

Instruction available: none
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack
 Equipment sales: none
 Equipment repair: fair
 Camera repair: none
 Air: to 3000 psi
 Guides: excellent

DIVERSIONS


Ground transportation: small sail boats
 Shopping: none
 Restaurants: none
 Nightlife: none
 Other sports: sailing, fishing, swimming, hiking
 Don't Miss: Cuna Indian village

JUST IN CASE...

Hospitals: none
 Diving doctors: none
 Recompression facilities: none
 Police: none
 Marine Rescue: none
 American Express: Representative office: Boyd Brothers, P.O. Box 805, Panama City, Panama—Ph: 62-0300
 U.S. Consulate: Ambler Holmes Moss, Avienda Balboa Y Calle 38, Apartado 6959 R.P. 5, Ph: 253-600

PLANNING

Diving tours: Moody's Pidertupo Village, Apartado 6-4092 El Dorado, Panama City, Panama
 Land tours: none
 On your own: Airlines—Braniff, Ph: 305-358.9400; Pan American Airways, Administration Bldg., P.O. Box 592096 AMF, Miami, FL 33159; Air Panama, 150 S.E. 2nd Ave, Suite 1320, Miami, FL 33131; LAN-Chile, 250 S.E. 2nd Ave, Suite 711, Miami, FL 33131
 Airports: Tocumen International, Panama City; service to Pidertupo by Servicios Aereo from Paitilla Airport, Panama City
 Cruise lines: none
 Marinas: Pidertupo Village
 Accommodations: Pidertupo Village
 Campgrounds: none
 Customs and Immigration: visa, passport
 Import restrictions: none
 How much cash may you bring into the country? unlimited
 Export restrictions: none
 How much native currency may you take out of the country? none
 U.S. Customs re-entry restrictions—you may bring back up to \$300 worth of goods and currency

A full-page photograph of a male diver in a red wetsuit, black mask, and snorkel. He is holding a Nikonos III camera in his right hand and is positioned on a wooden diving platform or ladder. The background is a clear blue sky.

This is the camera that's designed to make underwater photography as uncomplicated and successful as you want it to be. The only fine "35" that can go down to depths of 160 feet without a housing. So you don't waste time fitting pieces together and double-checking that everything is tight. You simply grab your Nikonos III and jump in. And, if you see a great picture topside or ashore, the camera is ready for it as quickly as you are—again with no special preparation and no needless bulk.

Of course, there's more to the Nikonos III than its constant picture-readiness and fast, easy operation. There's the magnificent quality of its famous Nikkor lens that helps you bring back the wonderful world below in stunningly sharp, colorfully life-like photographs. Moreover, you have a choice of four interchangeable Nikkor lenses, along with precision accessories designed to make your Nikonos photography even more enjoyable, both in and out of water.

See and try the unique Nikonos III, at Nikon camera dealers and selected dive shops. Or, write to Nikon Inc., Dept. N-24, Garden City, New York 11530. Subsidiary of Ehrenreich Photo-Optical Industries, Inc. In Canada: Nikon Division, Anglophoto Ltd., P.Q.

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Just great photography**

Advanced Instruction:

Ice Diving

Sure it's colder than a well-digger's posterior; it's also wild—and sensual!

BY JEANNE BEAR SLEEPER
PHOTOGRAPHY BY
KEN HAFNER

Yes it's cold—and wet. It's also exhilarating. Ice diving is a sensual experience in survival. Normal warm-weather visibility of five feet may be amplified 20 to 40 times under ice. Shafts of light sift through the crystallized water above, emerald-colored spotlights seeking an uncertain bottom.

You'll need more than a little dash and daring to survive the elements during a winter dive. You already have some of that or you wouldn't have gotten certified. The next thing you'll need is specialized training.

Ice diving is definitely a very advanced type of scuba experience and formal instruction will be needed before you can safely participate.

Training generally occurs in one of three ways. First, many dive stores and schools offer introductory ice diving courses. These allow you to work with a group of instructors and a small group of divers. The instructor supplies all equipment and generally dives with you in a one-to-one situation.

The second alternative is to take a full-fledged ice diving specialty course. The program will vary in length from 20 to 40 hours. These courses usually have more students per class than the introductory, and instructors will probably require you to buy some additional gear.

Jeanne Sleeper is Special Projects Director of NAUI and has presented programs on ice diving at conferences around the country.



ROBERT FREY

Third, you may just go ice diving with an experienced buddy. Because of the inherent difficulties and danger of entrapment, this method is definitely **not** recommended. Ice diving, like cave, wreck and deep diving, has a good safety record for individuals who have been trained. Unfortunately, we all must live with the fatality statistics of those who tried it on their own or believed their buddy really could show them how.

The specialty course is also an excellent time to review basic skills; ascents, octopus breathing, and new equipment. Instructors will update your knowledge of new diving practices and techniques. And, as with many sports, the more you learn, the more there is to learn.

The first question warm water divers ask about ice diving is pretty basic—why go under the ice? Depending on where you go ice diving, there are a variety of answers, but generally the most important one is the visibility under ice is much better than summer visibility. A lake that has five- to ten-foot summer visibility may have 50- to

200-foot visibility under the ice. Algae die during the winter, and the effects of wind and currents are reduced. Ice diving affords the opportunity to explore some lakes and quarries that would have virtually zero visibility during summer.

Ice diving lets you get wet almost year round. It's a form of expression for the northern diver, and affords some opportunities for creative humor. When is the last time you went cross-country skiing underwater, upside down, under the ice? And, of course, we've all heard the story about the two divers that hooked the ice fishermen's lines together so they could tug and battle each other for the rest of the afternoon.

Ice diving starts with a plan—monitoring the weather, checking ice depth, making sure access roads are plowed and open, gathering the necessary equipment and a gang of divers. Once you're at the lake, you'll find one of two weather outlooks; either clear blue skies with a little freezing wind, or somewhat warmer under a steely-gray sky that blends with the surface of the lake.

continued



After slipping along the highway, you finally make it to the dive site. The bracing wind beats on your face. You try to remember just how far offshore it was before the water was 20 feet deep. Remember the time you sawed the hole, hopped in and were standing knee deep in water? You load your gear on your back or in sleds and crunch on out to the dive site, eyes burning from the glare of the crystal white snow. Who would think that Polaroid sunglasses are a must for a winter dive?

Sweat trickles down your back as you shovel spokes on the ice's surface, clearing off an area for the hole and your gear. You laugh to yourself, thinking it ridiculous to be sweating on the inside and freezing on the outside. Once the site is prepared, you scurry into a changing tent or a van, or an ice hut, to get into your wet suit, or better yet, your dry suit.

It takes lots of people to make an ice dive really work, and you welcome the help of an assistant in putting on your gear. If you think walking across the beach wearing fins is tough, wait until you try it on snow.

It's finally your turn. You and your buddy have rehearsed the signals; you know your dive plan and you're ready to go. You sit on the edge of the ice and dangle your feet in the water, feeling a little crazy to be sitting on 24 inches of crystal blue ice. The cold permeates your wet suit; you can feel it creeping up your leg and its icy tingle sends a shiver up your back. It's now or never, so you



slither on down into the hole, resting your elbows on the ice and feeling that cold water creep up your back.

The adrenaline flows and you know you have to get underwater and see if all of this work has put you in the right place; to see if you can find a treasure, take your photographs or pet a fish. Your breathing is quick and sharp. Slow down, get control. Already you feel fingers and toes tingling. That's a little reassuring because in a few moments they're going to be numb and you won't feel them at all.

Under the ice, it's really a bizarre landscape as far as you can see—clear, black water. The light shines through spokes and paths where snow has been shoveled off the ice's surface. Bubbles trickle out of your regulator and collect at the surface pooling like mercury on a laboratory table top.

A tug on the line and your tender feeds out a little more. Getting near the bottom, you carefully avoid the mud, lest you stir up a swirling cloud. Your mask fogs up just a little from the tem-

perature difference, and the same thing has happened to your camera housing. Now it's decision time. Do you crack the mask and let a little water in to defog it, or do you try to see through the haze? Your head aches a bit now, the cold has permeated your cold water hood.

Thunderous rumblings crack through the water as ice shifts overhead. Studying the bottom of the ice, fractures can be seen criss-crossing the ice pack. Just like in the Arctic, it has shifted through weight, wind and water movement.

Summer's weeds have died off and it's now a sand and rock bottom. Nestled next to some larger boulders are sleeping northern pike. You can swim closely alongside the fish and perhaps if you're lucky, even pet one before it slowly wiggles away. You would never get that close in the summer! Snail shells litter the bottom; looks like someone broke a strand of pop-beads. After about 15 minutes in the 34-degree water, you feel that you're losing control in your hands and it seems like your fins are attached to your knees—it's time to return. Tug-

The view from below reveals a topside world that resembles a two dimensional painting, covered by frosted glass. The wooden frame, made of overlapping timbers, keeps the shape of the hole regular and prevents shifting ice from closing off the only escape route. Large arrows, like those at left, are formed by scraping the cover of snow off the ice. The arrows assure a disoriented diver an easy means of finding the hole.



ging your line, the tender begins to pull you in closer to that dot of light that is the surface.

As your head pops up willing hands grab your tank valve and arms, and boost you onto the ice surface. It's welcome help because you sure couldn't do it by yourself right now. Assistants strip off your gear and you hustle to the changing house before your boots freeze to the icy surface. Changing into warm dry clothes, it's now your turn to be a helper for the next buddy pair.

No doubt about it—ice diving is a thrill and a half. But while you may readily agree to the need for specialized training, you might not be aware of the special equipment it takes to have safe, fun ice dives.

You need a vehicle that will get you to the lake. Generally that means snow tires and maybe chains—possibly four-wheel drive. If you're really going to a remote location, you may even need a blade in front to plow a path. Once you arrive at the site, you'll need a large tarp to lay out your gear or it will quickly

be gobbled up by a snow bank. Heavy duty push shovels are needed to clear paths and working areas on the ice. The deeper the snow, the more shovels you'll want to help split up the shoveling. Picks and saws will be needed to chop the hole. Generally, a heavy pole with a chisel blade is used to chip away the starting holes, or you might use a Swedish auger. The saw used to cut the hole can be either a chain saw or an old fashioned two-man ice saw. Don't be too quick to select the modern chain saw, as they are known to flood and stall out. The worst that can happen to a hand saw is pooped-out operators.

You will need a place to change clothes and warm up before and after the dive. Some people use vans with catalytic heaters, others use portable ice houses. Even camping tents can be used, warmed with catalytic heaters. The deluxe version is a 23-foot motor home driven out onto the lake.

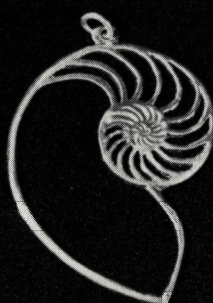
Don't forget to bring your dive flag. This is not to keep power boats away, but protect you from snowmobiles.

In the way of personal gear, each diver needs the best fitting, warmest exposure suit they can secure. Veteran ice divers generally agree that anyone who wears a two piece wet suit is a masochist. The warmest suit is a dry suit that has room for long underwear underneath. Other parts of the exposure suit include at least quarter-inch boots, three-fingered mitts, and a cold water hood that seals all the way to the mask. Over the wet suit, each diver wears a harness made of canvass webbing with D-rings sewn on the shoulders and perhaps on the chest strap. This harness is used to attach your safety line. Regular mask, fins, snorkel, back pack, tank and buoyancy compensators may be worn under the ice.

A special consideration is your regulator. The most dependable regulator for ice diving is a double hose regulator. However, they are not generally available and few divers own them. If using a single hose regulator, it should be one of the top models in a manufacturer's line, be balanced in operation and in top maintenance. Some single hose regulators will accept an anti-freeze cap over the first stage, since the first stage is most likely to freeze up. Unfortunately, when it freezes, you don't know if it is going to freeze open or shut. The second stage can also freeze in the open or shut position so the potential for losing your air is high. For this reason, many divers wear a pony bottle attached to their scuba tank. This smaller pony bottle is equipped with a completely separate regulator. It will allow enough air to get you to the surface if your primary regulator freezes up.

Good lines are one of the early investments that every ice diver must make. Since your life depends on the quality of that line, choose only the best. Tubular woven line used by mountain climbers works well for ice diving. It is strong, durable, accepts knots and

continued



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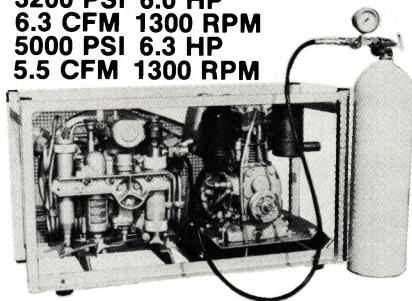
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ICE DIVING *continued*

doesn't freeze or kink. One end of the line is attached to the diver, the other end is attached to a metal spike pounded into the surface of the ice. The line tender will need to wear totally waterproof boots and mitts or he'll soon be soaking wet. Many line tenders also wear crampons. These are spike-like tracks which can be laced to the bottom of a regular pair of boots. They afford outstanding traction on the surface of the ice.

On the surface, a pair of safety divers should be suited up and ready to go whenever there are divers in the water. To keep them as dry, warm and comfortable as possible, it's good to provide them with a bench so they can sit down with their feet and seat clear of snow and water. Some ice diving groups carry a big block of styrofoam for divers to rest on. Others provide folding chairs and still others take seats out of their vans. The safety divers should have their own harnesses and safety lines.

Once back on the surface after a dive, you'll find some of the most important of the day's equipment to be hot chocolate and warm clothes.

In selecting outer wear it's important to remember weight, breathability and wind resistance qualities. Many of the newer types of Dacron fiber-filled nylon vests and one-piece jump suits are excellent. Also, it's important to get waterproof boots. Most leather boots are water resistant, but are not waterproof. What you really need are rubber boots that will not freeze and crack like plastic, but they are not very breathable and do not absorb foot perspiration unless you have felt liners in them. These boots can be purchased at an Army surplus store. Waterproof gloves may be purchased at many fishing supply houses, but they must be worn over wool gloves as they are generally not lined for warmth.

Another useful item that you may be kidded about, but will come to appreciate, is a little red sled. If you think walking across a sandy beach fully loaded with diving gear is tough, wait until you try walking through foot-deep snow carrying the same. The little red plastic sled sells for about \$6.98.

Ice diving demands additional training to be safe and enjoyable, but it promises satisfying benefits of camaraderie, accomplishment and adventure. Nearly every instructor association offers a specialty course in ice diving. Your local dive store or scuba instructor can get you started; after that, a new winter world is yours to explore. ☺



FREE AS A BIRD

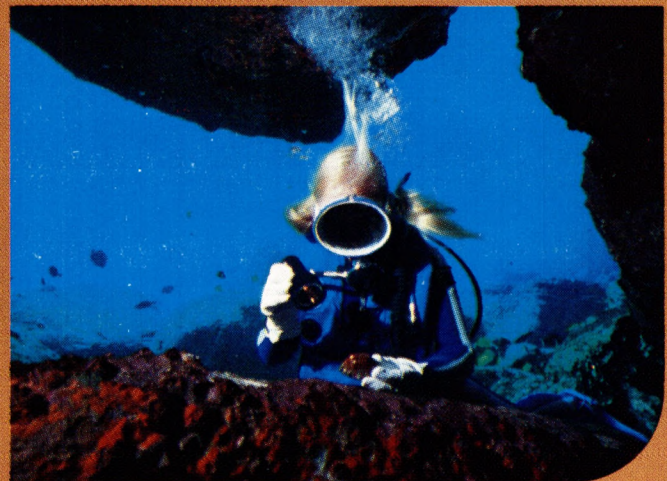
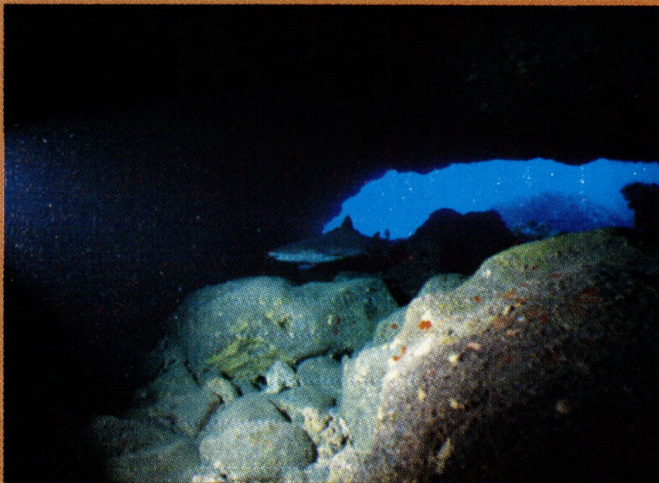
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RICHARD ELLIS

Aquatic Artist / Portfolio 3



SHELLS

Richard Ellis calls himself a “marine historian who draws.” In reality, he is a first-rate observer of aquatic life forms; one who has the ability to render his observations visually, with lifelike precision. His lifeless canvases project the presence of the living creature—so much so that, over the years, his work has appeared consistently in the best marine journals. After getting started as an exhibits designer for the Academy of Natural Sciences in Philadelphia, Ellis was pushed toward the ocean by the work he performed for the American Museum of Natural History, where he designed the Hall of the Biology of Fishes. In this interview he discusses why he stopped painting shells and his current work with whales.





Siratus virgineus (above)

Due to the number of closely related species, there is a great deal of confusion regarding identification of members of the genus *Siratus*. *Virgineus* may grow to six inches and it occurs throughout the northern Indian Ocean from East Africa to the Bay of Bengal.

Strombus alatus (preceding page)

The Florida Stromb is often confused with the larger Fighting Stromb. Yellowish orange, the Florida Stromb grows to only four inches and is fairly common from North Carolina to Texas. The heavier, more deeply colored Fighting Stromb is usually found only in the West Indies.

Spisula solidissima (preceding page, left)

The Surf Clam, also known as the Hen Clam, is the largest bivalve found on the Atlantic Coast. It may attain lengths of seven inches, with a thick, triangular shell of yellowish white. Although not as well known as the Quahog Clam, it is popular at clambakes.

SPORT DIVER: Did you study marine biology?

RICHARD ELLIS: No. I have done most of my research in the field or in libraries.

SD: But you manage to capture the nature and character of the animals you paint.

RE: I spend an awful lot of time studying them. When I began painting shells, (the first thing I did when I decided to become a painter), I would study each shell for hours before I began to draw it. I collected my first shells snorkeling in the British Virgin Islands. I lugged them home, having only a limited idea of their biological intricacies. As usual, I began to read all I could find out about them. I joined shell clubs, subscribed to shell magazines. It was also at this time that I became a certified diver. I wanted to collect my own specimens at depth.

SD: You wrote an article for *Audubon* called "Why I became an ex-shell painter."

RE: As I became more and more involved with the shell "industry" I realized how ecologically unsound it was. To collect shells for sale they dynamite reefs, destroy whole habitats with dredges. Most people don't even realize that the shell of a gastropod is its skeleton, not a house that it moves into like a hermit crab.

SD: What came after shells?

RE: I had been asked to illustrate various animals for the revised edition of the *Encyclopaedia Britannica*: fishes, land mammals, sharks and whales. I became particularly interested in the sharks, because I found them to be so well-designed. They are apex predators; the top of the food chain, and they are remarkably sophisticated for the job they have to do, not the dull-witted "swimming noses" as they have often been described. The encyclopaedia illustrations were tiny—about 7" long—and soon I began painting bigger and bigger sharks. This was in about 1973, long before the *Jaws* phenomenon, but I must admit that the success of the book and the movie didn't do me any harm. I had collected so much information that I decided to consolidate and communicate it. *The Book of Sharks* was the result.

SD: How did the book do?

RE: The first edition of 30,000 was sold out, and it is now in its second printing.

SD: You are probably best-known for your work on whales. Do you have a special feeling for them?

RE: When I started to work on the whales for *Audubon*, I thought that the research was going to be easy—after all, man has been whaling for centuries. We

ought to know what they look like, at least. In fact, we really don't. We know about the smaller porpoises and dolphins because we can see them in aquariums or oceanariums, but in many cases we have only seen the great whales dead, washed up on the beach or inflated with compressed air to keep them afloat alongside a whaling ship. I realized it would be a tremendous job to depict the whales accurately. This is a continuing project; I will keep on working on the whales because I feel that they are symbolic of man's insensitivity to the planet on which he lives and the creatures he is supposed to share it with.

SD: Have you now seen living whales?

RE: I was embarrassed to consider myself a whale painter who had never seen a whale. I've now been to Baja to see the gray whales, to Hawaii to see the humpbacks, (that's where I worked with Stan Waterman on his film *The Day of the Whale*), and to Canada to see the greatest animals that ever lived: the blue and fin whales.

SD: Aren't blue whales almost extinct?

RE: As far as we know, they're not. They were killed in enormous numbers—mostly in this century, by the way, not by the open boat whalers of New Bedford and Nantucket—but there are thought to be some 10,000 animals left. That's a far cry from the 250,000 that were thought to exist before factory-ship whaling began in the Antarctic, but it's a lot more than the 200 blues that some people say are left.

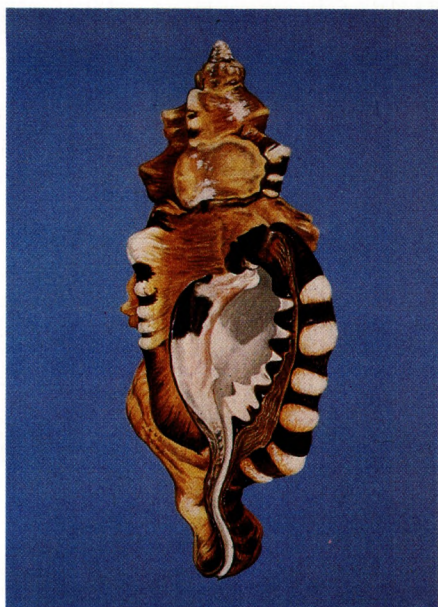
SD: What are you working on now?

RE: I've just completed the text for a book on the whales, dolphins and porpoises of the world—I also did the illustrations—and I'm now working on a series of exhibits for the Denver Museum of Natural History, which will include a fin whale mural.

SD: And after Denver, do you have any plans?

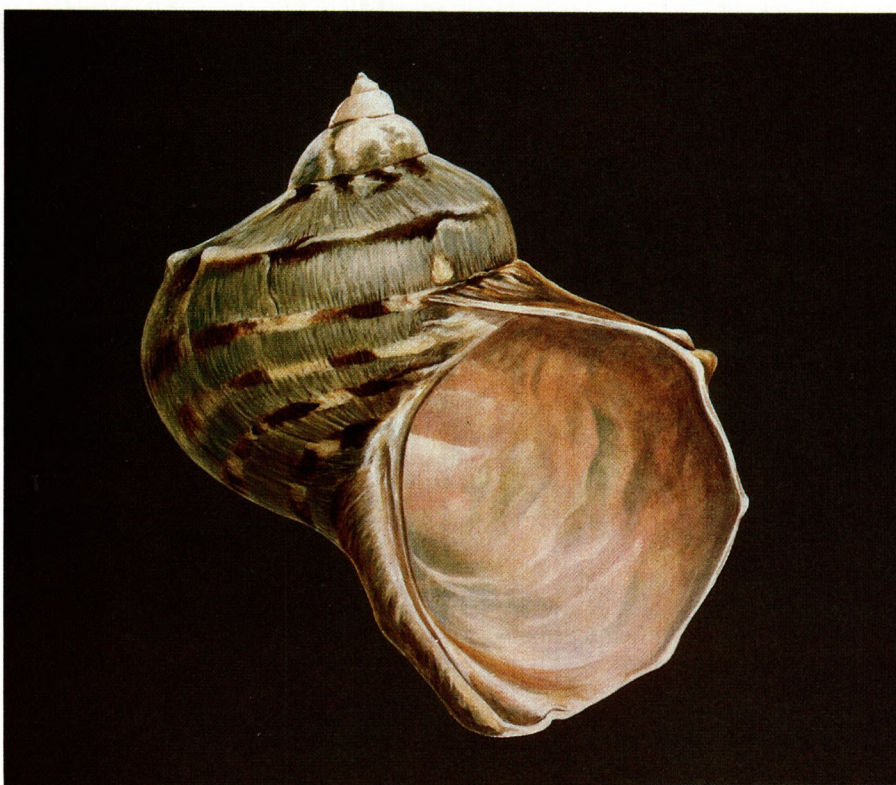
RE: I have been asked to write a narrative of the gray whale's incredible journey from Alaska to Baja every year, along with the history of California whaling. I just completed a painting of killer whales which I would like to issue as a limited edition print—I really like killer whales—and I want to do a history of whaling around the world. I want to dive with a blue whale; see the rare porpoises and dolphins of the Southern Ocean. Also, I've been asked to lecture on the biology of the sperm whale, perhaps the most fascinating animal that ever lived. I guess I'm just getting started.





Cymatium lotorium (above)

Common in the Philippine Islands, this orange-brown shell is unmistakable due to the rows of three nodules on the body whorls.



Turbo marmoratus (above right)

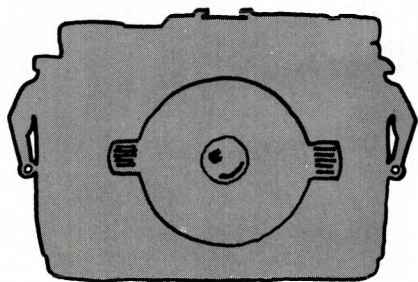
Common to the Indo-Pacific region, the Green Turban is used extensively for food and shellcraft. With a shell that can grow to eight inches, this mollusk's foot is armed with a large calcareous operculum claw.

Lunatia heros (right)

The Northern Moon Shell inhabits sand flats from the Gulf of St. Lawrence to North Carolina. The Moon Shell is a voracious feeder, boring into and devouring other mollusks, principally bivalves. The eggs are laid in a mass of sand particles, and after hardening, form the "sand collars" found on the beach during summer months.



The final installment of the Richard Ellis Portfolio will appear in an upcoming issue of *Sport Diver*. It will concentrate on the work for which he is best known, his paintings of whales. These illustrations have, at various times, appeared in such journals as *Audubon*, *Reader's Digest* and in *The Encyclopaedia Britannica*. Ellis is currently working on a whale mural in Denver, Colorado.



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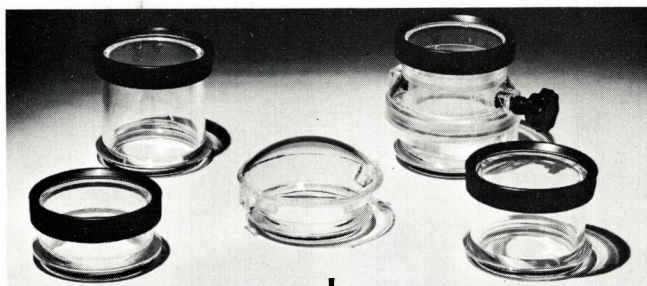
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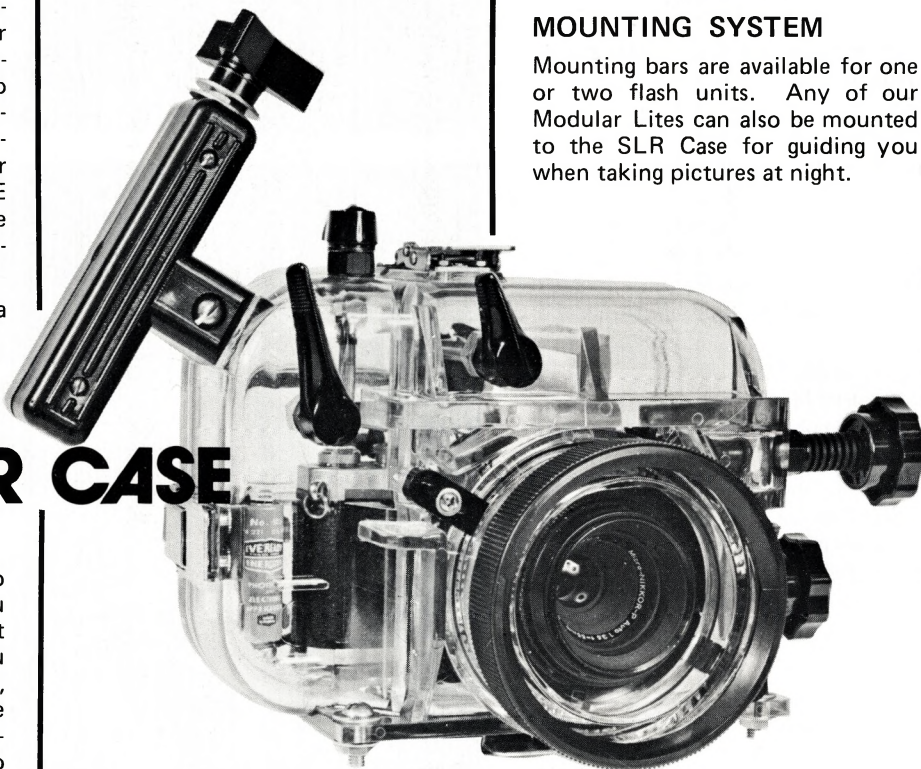
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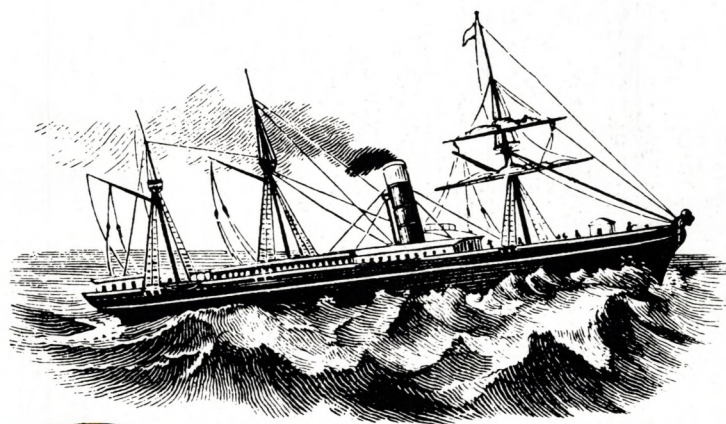
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History:
The Brave Deeds of

D. Harris and P. Jones

Early salvage divers didn't stretch the truth much more than the modern sportsmen.

BY HILLARY HAUSER

What follows is a factual account of a commercial diving operation that took place over 100 years ago, written in 1873 by Henry Siebe. Siebe's name is familiar to all commercial divers as the inventor of the Siebe-Gorman helmet. His book, *Conquest of the Sea—A Book About Divers and Diving*, comes with numerous woodcut engravings. They illustrate the wildest collection of diving bells, breathing inventions and mile-long snorkels ever assembled. Divers are pictured on the bottom, holding a fish in one hand and a sword in the other. But the real adventure begins in a chapter entitled, "Useful Works."

Siebe, in his unique prose, sets the stage:

"During the summer of 1842, a corporal and twenty three rank and file of the Royal Sappers and miners, and nine men of the East Indian Company's sappers, were employed at Spithead, under Major-General Pasley, in the removal of the wreck of the *Royal George*."

*Hillary Hauser is the author of numerous articles and two books on diving, **Women in Sport** and **The Living World of the Reef**. This issue marks her first contributions to **Sport Diver**.*

Sappers were a group of engineers and underwater technicians who dived with hardhat gear, executed "all minor fittings not requiring the skill of shipwrights," and assisted seamen and riggers in "naval arrangements."

These particular sappers were out to remove a ship, the *Royal George*, sunk in 98 feet of water in Portsmouth harbor. It had been a hazard to navigation, and the removal of this and other wrecks in the area was to be accomplished by these hardy underwater demolition teams. Two particularly brave divers emerge from Siebe's list of names: Corporal David Harris and Lance-Corporal P. Jones.

"Corporal Harris, almost entirely by his own diligence, removed, in little more than two months, the wreck of the *Perdita*, a mooring lighter, which was sunk in 1783, in the course of Mr. Tracy's unsuccessful efforts to weigh the *Royal George*." We never find out who Mr. Tracy is, but they should have told him that the *Royal George* was heavy. "It was about 60 feet in length, and embedded in mud 50 fathoms south of that vessel. The exposed timbers stood only 2 feet, 6 inches above the level of the bottom so that the exertions of Harris in removing the wreck were Herculean. Completely overpow-

continued

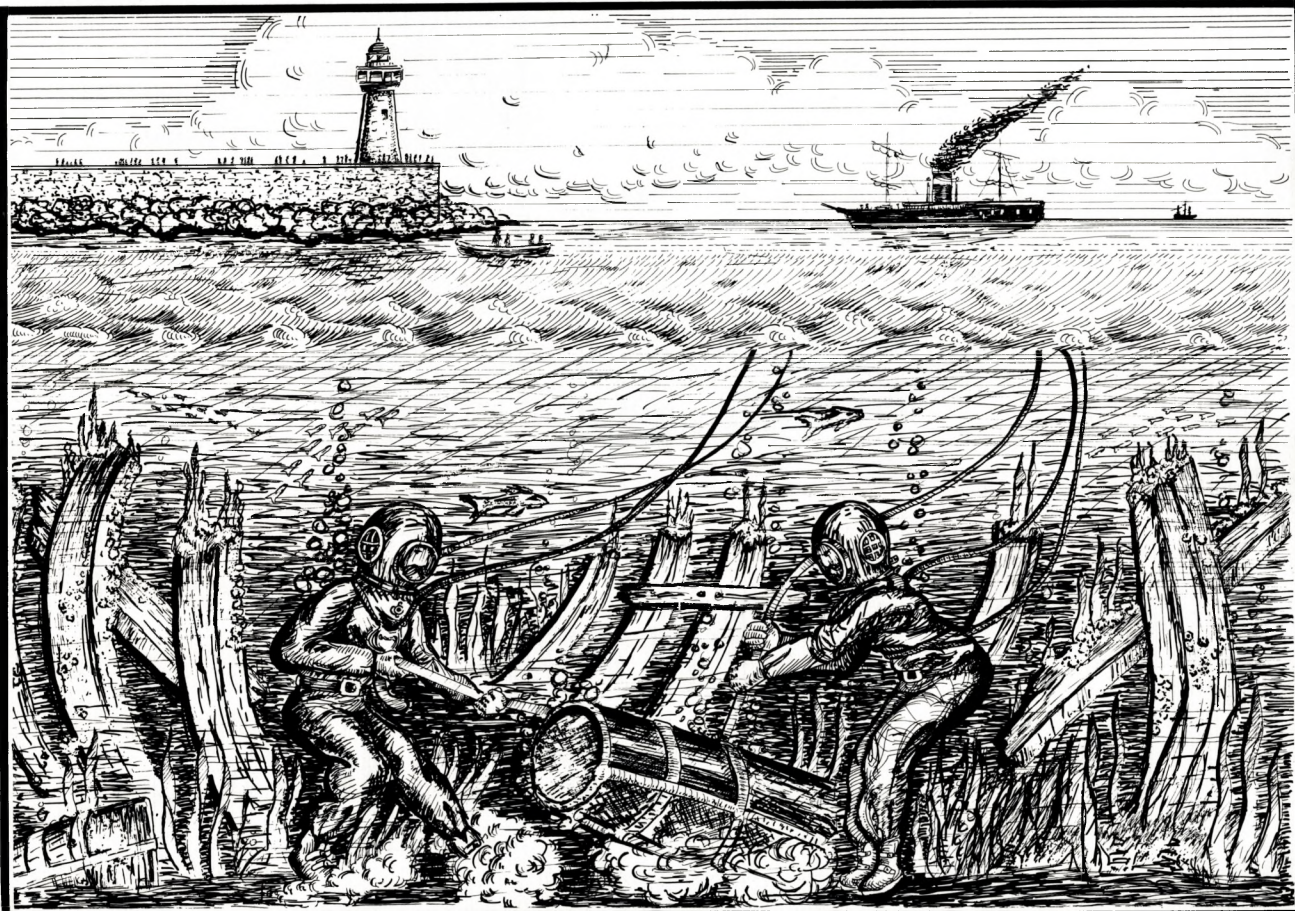


ILLUSTRATION: RON LAFFIN

ered by fatigue, he claimed a respite for a day or two to recruit his energies, and then resumed work with his accustomed asiduity and cheerfulness."

Apparently it was extraordinary to remain cheerful during work such as this. Fierce competition between the divers led to tug-of-wars on either end of old ship timbers, and pig iron ballast was a top priority item. Often, one diver would steal the credit of salvaging a batch of pig iron ballast, credit which rightfully belonged to some other sapper.

"There was a sort of abnegation, an absence of jealousy, in the character of Harris, which, as the rivalry among the divers made them somewhat selfish, gave prominence to his kindness. He met Cameron on the bottom, who led him to the spot where he was working. For a considerable time Cameron had fruitlessly laboured in slinging an awkward timber of some magnitude, when Harris readily stood in his place, and in a few minutes, using Cameron's breast line to make the necessary signals, sent the mass on deck. It was thus recorded to Cameron's credit; but the circumstances, on becoming known, was regarded with so much satisfaction, that honourable mention was made of it in the official journal."

The truth usually surfaced, though sometimes the divers didn't.

"Lance-Corporal Jones, a sagacious and indefatigable diver, was the most conspicuous for his success at the *Royal George*. In one day, besides slinging innumerable fragments, he sent up nearly three tons of pig iron ballast. The duty of recovering it, which was excessively trying, was confined to him. So painful and enlarged had his hands become in discharging it, that he was at last fairly beaten, and for a few days took an easier area at the bottom. Meanwhile, Private Hewitt, of the East Indian Company's sappers, one of the most spirited divers of his party, succeeded him, and led by mark lines to the spot, commenced his arduous task. Hard, indeed, did he labour to follow his predecessor, even at a remote distance, but on coming up, he declared it was impossible for anyone to work there. It appeared, for some time, that Jones in his dogged perseverance, had run his adventurous chances in gaps and gullies over his head in mud, and could only feel the ballast by forcing his hands down among the shingle as far as his strength permitted him to reach."

At least the indefatigable Jones and the spirited Hewitt weren't interested in

The truth usually surfaced, although sometimes the divers didn't.



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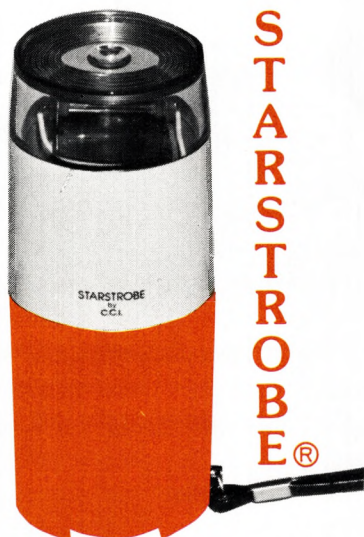


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BRAVE DEEDS *continued*

competing with each other. Sometimes the competition was more dangerous than the work. Jones and another diver, named Girvan, were at one point fighting over a floor timber of the wreck when Jones kicked in Girvan's faceplate. Water rushed into Girvan's dress and he was almost drowned before he was hauled aboard. It cost him two or three days in the hospital.

"On another day, Jones lodged on deck from his slings a crate containing eight 12-pounder shot. With singular success, he laid the remainder of the kelson open for recovery, and then sinking deeper, drew from the mud, in two hauls, nearly 35 feet of the keel. He also weighed a vessel of 6 tons burden, belonging to a Mr. Cussell, which drove, under a strong current, upon one of the lighters. Becoming entangled, the craft soon filled and foundered, grappling in her descent with the ladder of one of the divers. Grounding at a short distance from the interval between the lighters, Jones was selected to try his skill in rescuing her. At once descending, he fixed chains under her stern, and, while attempting to hold them in position by passing them round the mast, the tide turned, the vessels swung round, and the mast fell over the side, burying Jones under her sails and rigging. Perilous as was his situation, his fearlessness and presence of mind never for a moment forsook him.

Nothing was too venturesome for Jones to undertake, and the trial of enterprising expedients only whetted his wish to be the chief of their execution. It was desired to ascertain how long a diver could exist in his dress without communication with the external air. Jones, offering himself for the experiment, remained ten minutes on the deck of the lighter, cased up as if hermetically sealed, without experiencing any inconvenience. A more dangerous trial followed. A clever man had expressed his conviction that, if the air pipe were to burst on deck, and the diver were not immediately drawn up, he would be suffocated. Notwithstanding this scientific speculation, Jones descended, and the pump, by signal, ceased. Five minutes he continued unsupplied from above, but a feeling of pressure having then commenced on his chest, he signalled for air. The knowledge thus acquired proved that a diver had ample time to be drawn up before the air in his dress became too vitiated to sustain life."

The "clever man" who dreamed up this last experiment was no doubt Gir-

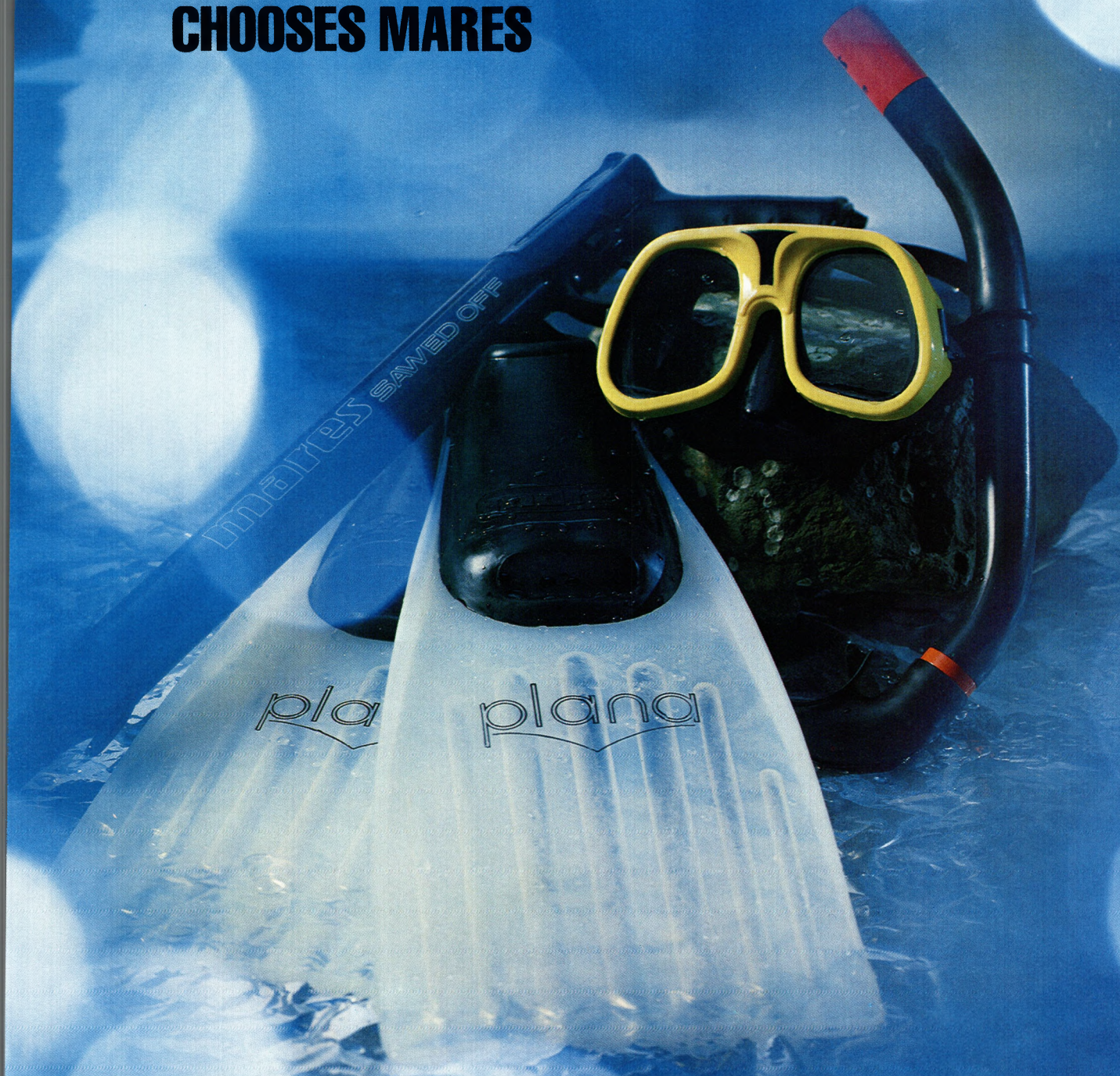
van, probably still mad at Jones for kicking in his faceplate. Or could it be that Jones really believed it was in the interest of diving science to learn how long it would take him to suffocate? In any case, Jones executed this feat and went on to an even tougher situation.

"On going down to examine the progress made in the removal of the *Perdita*, Jones encountered a human body, which had been drowned about six weeks. It felt round and hard, was nude to the waist, but clothed in trousers to the ankles. Jones was a long time before he could discover what it was that annoyed him. On tracing with his fingers the course of the spinal column, it felt as if the vertebrae were as distinct as the bars of an iron grating. The thought suddenly possessed him that he was handling the remains of a fellow creature. Horror-stricken at the idea, he rushed up the ladder, and it was some hours before he could sufficiently master his feelings to redescend. When he did so he went to the spot where the body had visited him, and removed the timber he had previously secured. He was, however, no more troubled with the submarine apparition, nor with the return of his melancholy emotions. Two days later, Corporal Harris had an interview with a strange substance at the foot of his ladder, but, not over nice in his sensations, he stuck his prickler into it. When he pulled it up to the surface, it turned out to be the mutilated remains that had molested the sensitive Jones."

"These two non-commissioned officers were now equal to the best divers in Europe, and their daring exploits at the bottom of the sea, under a great depth of water, with a strong tide, and traversing a space covered with thick mud, embarrassed by iron and shingle ballast, large timbers, guns, and a thousand other obstacles, were constantly recorded in the newspapers of the day, and filled the public with wonder."

Siebe finally rates the skills of D. Harris and P. Jones with the best divers in Europe. But, in spite of all their daring deeds, and in spite of their recorded bravery, they have, sadly, faded into anonymity. And they are, in most of their actions, without peers or successors. No modern diver I know has ever dived into mud embarrassed by iron and other offal. No colleague of mine would ever submit to being called a sapper, or allow the air in his dress to become arbitrarily vitiated for the sake of an experiment. What diver has had an interview with a strange substance? It's not surprising the public was filled with wonder; it should be still. ☹

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Underwater Photography: **Choosing and Using a Model**

Adding people to your pictures can be a real pain—or an incredible improvement. Here's how.

BY RICK FREHSEE



Why use people?

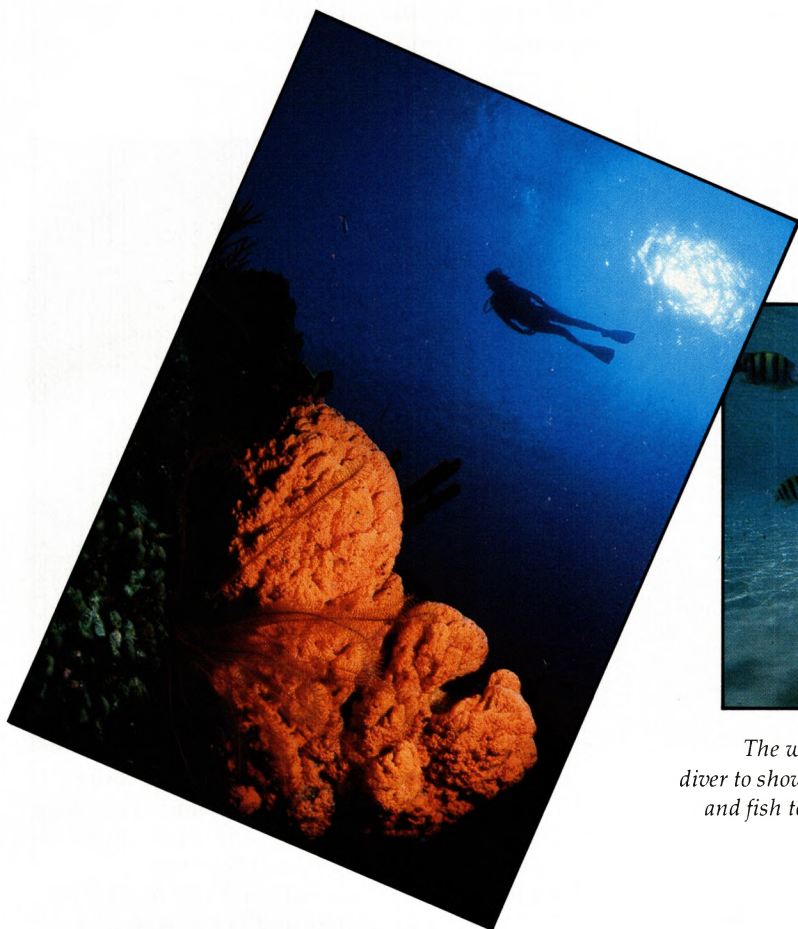
No subject matter pursued by the underwater photographer is of greater general interest than a picture of another diver underwater. There are two reasons for the popularity of people pictures—they stimulate more human interest and identification, and provide a size relationship and perspective to the submarine world.

For divers, no adventure is complete unless told by pictures. No verbal description can portray the surrealistic majesty and mystery of the divers' journey as well. A diver-photographer who takes bright, colorful pictures has considerably extended his bottom time as he relives his adventures and shares them with friends through slides or prints. For non-divers, who represent more than 99 percent of the population of this planet, underwater photography provides their closest association with the undersea world. Without it, the hu-



People add a facet to underwater photographs which cannot be duplicated by any other means. A diver adds scale to a wide angle view of a wall (above left), allowing the viewer to make an accurate assessment of the size of the anchor in the foreground. The photo above would be just another catalog of a pretty sponge without the diver to show the size and provide some viewer identification.

*Photographer Rick Frehsee is a regular contributor to **Sport Diver**. His photos have appeared in *Life*, among dozens of others, and he often works with major national advertising agencies.*



The wall (above left) would be far less impressive without the diver to show the scale and sweep of the view. Photographs of divers and fish together get to the essence of diving—people interacting with the ocean.

man population as a whole would know the ocean world only through the dry-land descriptions of laboratory biologists or through books written by the handful of authors who have taken the plunge.

While this philosophical approach to people pictures and underwater photography may seem overstated, there is a tendency to minimize the importance of people pictures underwater. There are those who pursue other kinds of underwater photography, such as fish portraits or macro photography. This approach is definitely aesthetic and greatly appreciated by divers. Photographs of marine critters and landscapes can be colorful and breathtaking; but visual interpretations of undersea adventures, diver travel and expeditions, wreck diving, treasure hunting and the sum total of what divers do underwater is best portrayed through people pictures.

Your model

While the human form is potentially among the most beautiful of subjects, nothing is so ugly as a bug-eyed diver, mouth swollen by regulator; human form distorted and maligned by baggy equipment, straps, and hoses; arms and legs drifting and flailing. Your subject diver, or underwater model, and his or

her contributions, are of utmost importance to the success of the photograph. The model must portray the look and confidence of an accomplished diver, safe and comfortable in the marine environment. The selection of models should be based upon their knowledge of modeling plus diving ability.

The model's equipment

Over the last ten years, the amount and size of the equipment worn by the well-equipped diver has increased. Most of this increase is justified by diver safety, comfort and convenience. Full wetsuits allow greater thermal protection, large bouyancy compensators allow greater swimming control and surface safety, and octopus regulators contribute to easier buddy breathing. While much of this equipment is available in pretty colors, it does obscure the flowing lines of a balanced human form. Unless the photograph is designed specifically to show off the equipment, a successful compromise between the amount of equipment and amount of human form revealed is necessary. And the selection of equipment worn must compliment the diver.

This compromise is not without challenge. A divergence of interests does exist between the pictorialists, such as

advertising agencies, who naturally prefer the barest of equipment on swim-suited models, and diving educators and manufacturers who prefer the full equipment approach.

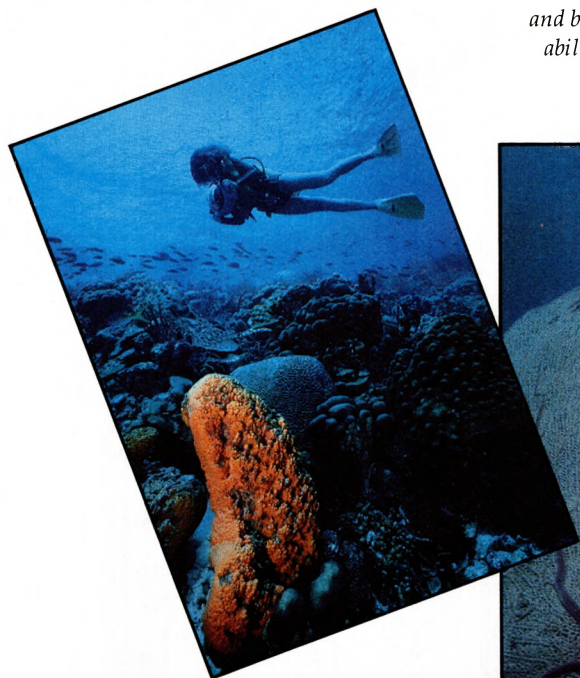
The diving leadership prefers to focus on safety and equipment; the Madison Avenue types rely on a time-proven recipe of romance, adventure, fantasy and sex appeal. I have been criticized by the strict safety types for showing a single diver because they feel this promotes diving without a buddy. On the other side, an advertising executive recently scolded me for showing a diver without speargun in hand for protection against sharks and sea monsters.

Conditioning

Your model should be physically attractive and physically and mentally self sufficient in the water. While a certification card is no guarantee, it is a natural prerequisite. In addition to the C-card, a pool test of diving ability and photographic presence may help.

The last thing the photographer needs is to worry about the confidence and ability of the model while in the field. Model divers should be in good physical condition from an aerobic point of view. Someone who is into jogging or swimming on a regular basis gene-

continued



The sea fans (below) would be of little interest were there no human face to draw the eye and balance the composition. It is important that your model look relaxed in the water. The ability to convey grace (left) may come from natural instincts, or it may have been instilled by experience in dancing or gymnastics.



rally can work longer hours in more difficult situations underwater. Physical stamina will contribute to a more relaxed and confident diver, one who will look that way in your photographs.

Appearance

Body weight is a consideration in underwater modeling. A wetsuit adds 15 to 20 pounds of visual body weight in the photograph. "Macho man", with the build and figure of an offensive lineman, might come across as a manly type top-side, but in general both men and women look most attractive in wetsuits if they possess a thin figure.

The excess material from mask, fins, backpack and weightbelt straps should be cut off and the ends burned so they won't unravel. The pressure gauge can be held against the weightbelt with a rubber band. Tape the BC pocket closed so it won't float up from the vest.

In tropical waters, bikinis and swimsuits can be selected to compliment the models' figures. While the fads and popularity of swimsuits change, for females, the basic two-piece bikini and the recently popular high-cut one-piece swimsuit or nylon tank suit are generally preferred. For men, the nylon swimsuit or tank suit or boxer style jogging trunks are attractive. Surfing style baggies for men look like comic underwear.

Positioning

Previsualize your diver models, flowing in form and concentrating on fin kicks for propulsion rather than sculling with

hands. The face must be relaxed behind mask and regulator, eyes bright and alert. The decisive moment for model divers comes when the legs are alternating in kick and the body is relaxed in an asymmetric position, slightly off-center of the photograph.

The eyes relate to a secondary subject and provide human identification. If the photograph is a close up and the eyes are not revealed, a one-eyed cyclops look will be caused by the face mask.

If the model is female, long flowing hair may be an asset. The drawback is that if the shot is set and posed the hair may obscure the face mask. This can be avoided by "swimming" into position or bobbing the head forward.

Planning

An absolute necessity in underwater modeling is the planning and briefing session prior to the shooting. The two greatest problems in photographing people underwater are cold and communication. Even in tropical areas, a model diver must plan for long periods in the water and economize on that time through proper photo planning. As you plan your dive and dive your plan, you must also provide a photo plan to reflect priority photographs. A diver that is cold is not apt to be flexible and productive. In addition, the problems of communicating underwater are apparent.

Your equipment

For the best people pictures, use the best equipment you can obtain. On a

typical advertising shoot I use seven cameras: four Nikonos cameras with two 15 mm, one 21 mm, and one 7.5 mm fisheye lenses; and three Nikon F2A cameras in metal housings, fitted with 24 mm, 15 mm, and 16 mm lenses. A CC30R (Color Compensating 30 Red) filter is fitted in front of or behind most of the lenses to warm up the skin tones; that is, to reduce the excessive blueness caused by absorption of red light.

A strobe is essential to bring out the natural color of both your model and the environment, and you should choose one with a lower color temperature, one that has a flashtube that puts out light at or below 5500° Kelvin.

I rarely wear fins when shooting in a place with a sand or silt bottom. Fins inevitably kick up loose sediment.

Attention to detail

Good underwater people pictures are the result of good models and good planning. The techniques described here are the ones I use; very few of them are entirely original, most were developed by other underwater photographers. They constitute an approach designed to handle professional assignments, and all of these preparations may not be necessary for the hobbyist. However, I have found each of the many details important enough to justify the effort required. Hopefully, they can help you produce pictures that are just a little bit different and special. At the very least, they will improve anyone's people pictures.



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Profile:
**Eugenie
Clark**
The Shark Lady



BY HILLARY HAUSER
PHOTOGRAPHY BY
DAVID DOUBILET

"All about me were glass tanks with moving creatures in them. At the back was a tank larger than the others, the water in it was less clear, more mysterious. It was pale green, and a few feet from the glass wall that I looked through, it grew misty, as if there were no farther wall and the water went on and on.

Leaning over the brass railing, I brought my face as close as possible to the glass and pretended I was walking on the bottom of the sea."



Eugenie Clark, age nine, had been left by her mother at the old aquarium in Battery Park that used to stand at the tip of Manhattan, and these were recollections of her first look at fish, written in her book, *Lady With A Spear* (Harper & Row). The year was 1931, and her mother had gone on to work, telling Eugenie to amuse herself. "So casually, recalls Eugenie, "I entered the world of water."

Clark has lived a charmed life in, on, or near the sea since her introduction to fish in the aquarium, but nothing happened by magic. At age nine, all she knew was that she wanted to understand everything she possibly could about fish. Her perseverance has resulted in some important data on all sorts of fishes, from the odd Moses sole of the Red Sea to the sleeping sharks of Mexico, from the mysterious "flashlight fish" of the Red Sea, to the plectognaths of the South Pacific. However, at the top, middle and bottom of her list of ichthyological subjects are sharks. Eugenie Clark is called "The Shark Lady," and for good reason: she has swum with them, trained them, lived, breathed with, and eaten them.

The first obstacle to Clark's insatiable curiosity came from her grandmother. As a young girl, Clark brought home toads, salamanders, birds, alligators, and just about anything else she could catch or wrestle down. Her pursuits were not exactly encouraged, so she always seemed to have a lot of dead things hidden in the closet. Her grandmother wondered why she didn't develop an interest in something more useful, like typing. One confrontation between these two occurred when Clark wanted to have a look at a rat's skeleton. She had a dead rat handy, but it was necessary for her to boil it first. While her grandmother was away from the house one day, she got the rat into a pot of water and turned it on high. Grandmother returned suddenly, wanting to know what was cooking.

This lack of encouragement seemed to follow her even in later years. After obtaining a bachelor's degree in zoology from Hunter College in New York, Clark applied to Columbia University for her doctorate. She was told in essence, "Go home, get married, and have babies." In-

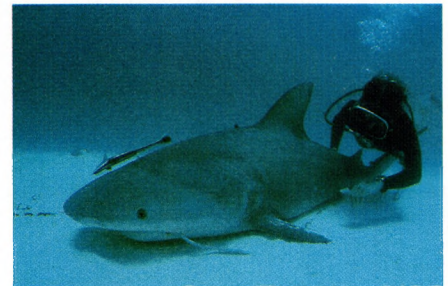
stead she acquired more fish to study, and in 1942, was admitted to the doctorate program at New York University.

In 1946 she received an M.A. degree from NYU, and went to California to work as a research assistant at Scripps Institute in La Jolla. Dr. Carl L. Hubbs was then conducting some innovative studies in the waters off Southern California, and under his guidance Clark was introduced to diving with a hard hat. Soon came another obstacle, a near disaster. Clark was diving when her air hose jammed. She began to pass out before she realized what was happening, but managed to abandon the helmet and surface. She was pulled to the ship by Dr. Hubbs, who insisted that she get back into the water almost immediately; he wouldn't allow her time to develop any fears about diving.

Clark received a fellowship from the Pacific Science Board in 1948 to study blowfish in the South Seas. This time, the diving methods were on the other end of the spectrum from the hard hat routines of Dr. Hubbs. Compressed air on remote islands was unattainable, so Clark learned free diving and spearfishing skills from a Palauan named Siakong. According to Clark, Siakong was a "betel-chewing, wife-beating drunkard," who happened to be the best diver in the world. His normal diving attire was a small red loincloth and homemade goggles. He and Clark would take a small boat out to the reefs off Koror, throwing nets to catch fish. Siakong also showed her how to use the spears he had made from bamboo and metal. Clark collected all of her samples using methods learned from Siakong, and her blowfish studies were a success.

Eugenie returned to NYU, and in 1950 received her Doctor of Philosophy degree. Then she won a Fulbright Scholarship to conduct a one-year study of poisonous fishes in the Red Sea. She arrived in Cairo on Christmas Eve, 1950. Her home for the next year was a marine biological station at Ghardaia at the eastern edge of the Libyan desert. Here, Clark studied manatees, fishes, and learned the local Arabic dialect. Though she may not have realized it then, this marked the beginning of Clark's love for this part of the world. To date, she has made 22 trips to the Red Sea to study the sharks, eels and fish there.

Until the time of Eugenie's first visit, in 1950, the Red Sea had been all but



Eugenie's experiments have carried her to all parts of the world to work in difficult, and somewhat dangerous circumstances. Bull sharks, like the one hooked above, have been known to attack swimmers. In a toxicity experiment, Eugenie holds a reef fish inside a bag with a Moses sole (bottom). The sole excretes a fluid which protects it from predators, and which is toxic to many marine species. Perhaps Clark's favorite workshop is the Red Sea (right). Here she has found a diversity of life she feels is unmatched anywhere in the world. Certainly for an ichthyologist, the number of species unique to the region would make it a paradise on earth.

Hillary Hauser is a freelance writer working from Southern California. This is her first assignment for Sport Diver.



overlooked by scientists. After her studies, however, ichthyologists and marine biologists from all over the world flocked to the area. From experiences in the South Pacific and the Red Sea came her first book, *Lady With A Spear*, published in 1953. It has been translated into eight languages and Braille.

Lady With A Spear was immediately popular. Two of its readers were William and Anne Vanderbilt, of Florida. They approached Clark with the idea of setting up a marine laboratory in western Florida, for the study of marine life, and as a center where people could learn more about the sea. Clark eagerly accepted, and this marked the beginning of her intense study of sharks.

In January, 1955, Clark opened the doors of the Cape Haze Marine Laboratory, founded by William H. and Alfred G. Vanderbilt. The lab itself was a small 12-foot by 20-foot wooden building, and Clark had a small dock with an adjacent shark pen. She began to experiment. In the 12 years she tested and studied at Cape Haze Clark concentrated on sharks' behavior, and tested their memories and ability to learn. She taught sharks to push a target and ring a bell for "reward" food. She trained them to choose between targets of different designs and colors. She found that sharks were able to make visual discriminations—information not known

before. Most startling, she found that sharks can learn, and that they remember what they learn. They can tell light from dark, and they can recognize the difference between horizontal stripes and vertical stripes.

Clark's unusual experiments with sharks became known around the world. In the fall of 1965 she visited Japan, and was invited to the palace of the Crown Prince. As a sort of gift, Clark took along a trained shark, and had it show its tricks to the Crown Prince and his court. The prince was delighted, his curiosity for the underwater world aroused. He asked Clark to teach him how to dive, and she did.

In 1967, Clark left Cape Haze and moved back to New York. The lab went under the direction of her associate and colleague, Dr. Perry Gilbert, another noted shark expert, and was eventually renamed Mote Marine Laboratory. Clark's shark studies there comprise the subject of her book, *The Lady and the Sharks*, published in 1969.

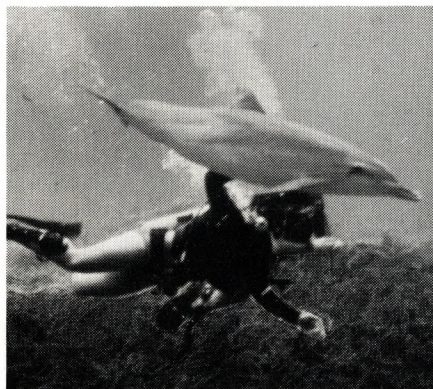
It has long been thought that sharks, especially the fast-swimming species, have to keep moving in order to breathe, flushing oxygen-rich water over their gills. In 1972, Clark received a letter from Mexican underwater photographer Ramon Bravo, with photographs that showed sharks sleeping in a cave off Isla Mujeres. Mexican divers

reported seeing four species there—blue, lemon, ridge-back and bull—all dangerous to man, and never known to remain stationary. Clark's curiosity was aroused. If whatever caused the sharks to be so docile could be duplicated, perhaps shark attacks on swimmers could be reduced. She made an excursion to Isla Mujeres during Thanksgiving of that year, but found no sharks. In April, 1973, Clark returned again to Isla Mujeres, this time with support from the National Geographic Society and the Mexican Consejo Nacional de Turismo. Three of her four children (Hera, today aged 25; Aya, 23; Tak, 21; and Niki, 20) came along as assistants.

When Clark swam into the cave there were sharks, but all were one species, *Carcharhinus springeri*, (a ridge-back of the requiem family). Instead of being agitated by the presence of humans, the sharks remained in the sort of stupor Bravo had described. The scientists learned that the sharks did not really seem to "sleep," but watched all of the human movements in the cave. It was very unusual behavior, and the scientists looked for clues. Clark and her students found remoras actively cleaning "sleeping" sharks, and observed the oxygen level in the deepest, dead-end parts of the cave was higher than normal. Clark surmised this enabled the

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EUGENIE CLARK *continued*

sharks to lie still for hours. The students postulated that the sharks enjoyed some sort of "high" by exposing themselves to a possible electromagnetic field created by the mingling of fresh and salt water in the cave. Another student discovered CO₂ was present in above-normal amounts. This may have an anesthetic effect on some sharks.

Clark wondered whether fish slept the way humans sleep, or the way other animals sleep. She wondered whether sharks slept anywhere else in the world. In 1976 she got the chance to pursue her questions, in Japan. With her were Anita George, a graduate student, and Clark's 75-year-old stepfather, Nobusan. Clark wanted to look at the sharks of Japan, and now she got her wish; in one bay they found over 100 sharks, some swimming, some thrashing in shallow water, and some in caves, piled on top of each other sleeping. Clark and her assistants simply stood knee deep in water and recorded the whole scene by bending over, holding the camera underwater while scores of sharks swam by. Where in Mexico Clark had found just one species of shark in the caves, in Japan she found two types: a white-tip reef shark, and the smaller Japanese requiem shark.

The shark studies continue today. During November of 1978, Clark accompanied a filming expedition to the Great Barrier Reef of Australia ("My first trip there!" she said excitedly). Noted underwater filmmaker Stan Waterman was documenting the great white shark for a television special, and Clark hoped to conduct several experiments. She wanted particularly to test the effect of the Moses sole on the great white shark.

During her Red Sea studies, Clark discovered the toxic qualities of the odd Moses sole (*Pardachirus marmoratus*). She found that the white fluid which oozed from the fish killed small fishes, and she tested the reaction of sharks to the sole itself. She found they always avoided this fish. If the Moses sole were "washed" with alcohol, then a shark would eat it right up. The alcohol obviously removed this poisonous fluid—but what was the fluid? It had been reported by an ichthyologist in 1871, but no one had known it was toxic until Clark began her experiments. This fluid may serve as an effective shark repellent: one test Clark conducted revealed that a thimbleful can keep sharks away up to 18 hours. Already, one company has combined the fluid with suntan lotion.

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All of these tests were made with the Moses sole of the Red Sea. Clark learned that Japan had its version of this highly toxic fish, and that Australia did, too. Toxic soles are called scientifically *Pardachirus*, and there are four known species. The Red Sea sole is *P. marmortus*, the species from Japan is *P. pavoninus*, and Australia has its *P. hedleyi*. Clark hoped if she were not able to get a Moses sole to Australia for her experiments, she could capture a *P. hedleyi*, to test on a great white shark.

Clark's list of honors and awards is practically endless. She is written about in *Who's Who in the East*, *Who's Who in America*, *Who's Who in the World*, *Who's Who in the South and Southwest*, and *World Who's Who in Science*. Clark has received awards from the Underwater Society of America, the American Littoral Society and the Gold Medal Award of the Society of Women Geographers. Currently, she is professor of zoology at the University of Maryland,

With her "left over" time, Clark serves as vice-chairman of the National Parks and Conservation Association, and in 1975 she represented NPCA at the First International Conference on Marine Parks and Reserves in Tokyo. She has also volunteered her aid to the Holy Land Conservation Fund, which is working to preserve the unique environment of the Red Sea. She has even volunteered to serve as a ranger in the South Sinai Marine Reserve. This March, Clark will take a group to the Sinai, and while there, she hopes to further the idea of Egypt and Israel uniting in the common cause of underwater conservation. "Already," she says, "Americans, Israelis and Egyptians have formed their first workshop, in Cairo, to talk about arid ecosystems. We're hoping this will lead to the development of a conservation program for the underwater reefs around the Sinai. Ras Muhammad, at the very tip of the Sinai, is one of the most spectacular underwater areas in the world."

Clark's insatiable curiosity, which started with salamanders and toads, has not diminished. She continues her studies of everything that interests her, and she encourages youngsters to get involved in what interests them most. She was never destined to be a typist—she became instead an observer of eels, flashlight fish, Moses soles, and sharks.

In all this time, her goals haven't changed. She wants to understand everything about fish. The goal may be impossible to reach, but according to her colleagues, Eugenie Clark is closing in on it, fast.

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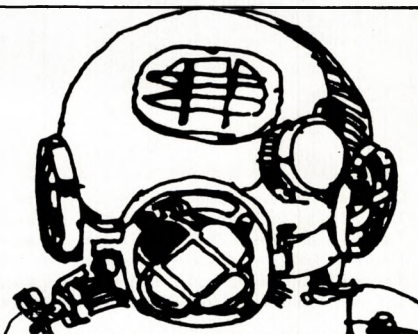


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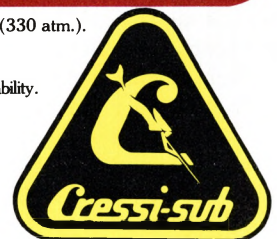
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BY PHIL TRUPP



OCEAN TRUST FOUNDATION

The dream of underwater cinematographer Al Giddings, R.V. Eagle is virtually two blocks of Burbank Studios—afloat.

The voice of Al Giddings, underwater cinematographer, crackles over the phone from San Francisco to Washington, D.C.

"You *really* expect me to do an interview over the phone? Tell me, did I ever meet you?"

"No."

"So I don't know you, right? I can't do it over the phone. I mean, you're asking me to talk about the next 30 years of my life."

At 41, Giddings is possibly projecting forever. He's edgy. And lucky. Most men do not have before them the complete instrument of their dreams, a tool with which to immortalize and define themselves.

Giddings has it. It makes him touchy.

He is speaking from the dream itself: a 221-foot converted minesweeper which he calls *RV Eagle*. Docked at San Francisco's Embarcadero, it is virtually two blocks of Burbank, a floating TV production studio prepared to sail across countless tubes with a message.

Phil Trupp is Sport Diver's Washington bureau chief. He was a founding editor of Washingtonian Magazine and has authored a number of books.

"It is our goal to make *Eagle* a standard-bearer for the United States for responsible ocean conservation policy..."

This is the manifesto according to Giddings, described in a press release bearing the name of his company, Sea Films, Inc. The statement is clear-cut, almost simplistic. But it becomes more ambitious with each word: "Since network television programs reach more people... than other forms of communication, *Eagle's* 'eyes in the sea' should provide a powerful force in shaping world opinion."

Giddings doesn't wish to be misunderstood, and this comes across over the phone. He tells of visiting reporters who smile, scribble, and report lies. He complains of distorted interviews, misleading quotes. He sounds a bit like an irate Frank Sinatra.

Such is the lot of celebrities. Surely Giddings is as celebrated in his field as Ol' Blue Eyes is on stage. His stocky, square features aren't those of an idol, but his reputation makes up for it. Not even Ol' Blue Eyes was visited by Jackie Onassis (she considered him boorish). But Jackie-O is a Giddings booster and he drops her name almost casually.

Giddings says if he can't have a face-to-face interview, "I don't want the

story to run. Sorry."

He says it with characteristic authority, as if by a few words the presses will stop rolling. This is to be expected from a man who is described by his close colleague Stan Waterman as a "master planner, the consummate director."

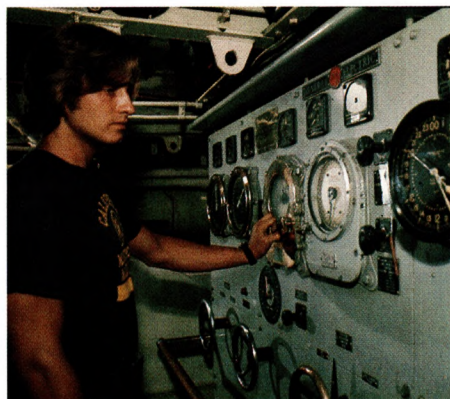
Director. It's the key word in any description of Al Giddings.

I recalled a short film, *The Making of the Deep*, showing Waterman, Chuck Nicklin and Giddings shooting extraordinary footage for producer Peter Guber's box office smash. (Guber is part of the Sea Films set-up, being the link to the networks.) In *Making*, Waterman and Nicklin study Giddings' directorship, which is terse, elaborate, somehow quite final. There will be no goofs and no accidents, Giddings declares. Getting hurt might terminate the shoot. And, after all, they're only filming annoyed sharks. The audience titters nervously at Giddings' super-tough philosophy. But they fail to understand that in Hollywood, producers don't bother with the indelicacies of a shark-gobbled arm, leg, or both. If there are to be tears, they will be displayed at the box office or the bank.

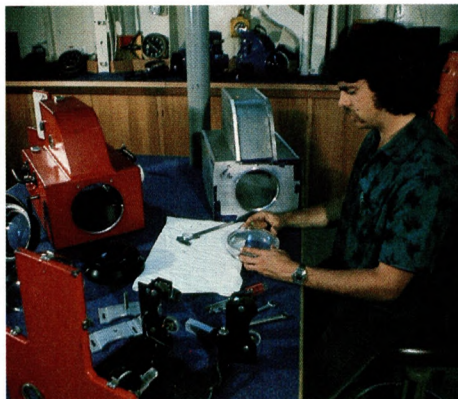
Giddings is admirably prepared to deal in such a world. He is a craftsman

continued

In the Eagle's engine room, Rick Reinbold checks speed indicators. With a range of 14,000 miles, the vessel will serve both as a complete film production facility and as a research base for advanced scientific projects under the direction of Dr. Sylvia Earle.



Technician Joseph Coonrad checks the Giddings-designed Panavision camera housings used in filming *The Deep*. Technical advances Giddings engineered for Hollywood productions will allow him to produce highest quality footage for a series of network television specials.



OCEAN TRUST FOUNDATION

and an innovator to whom underwater Hollywood owes a great debt. His camera systems are responsible for some of the most remarkable undersea footage ever exposed. His ability to make the shoot, no matter what, have turned so-so plots into white-knucklers.

Now he has his own Hollywood, a sea-going production company of incredibly sophisticated proportions. *Eagle's* potential is unrivalled.

"Al's into this as much—no, more!—than anything he's ever done," says Walt Clayton, one of the Giddings crew who will make *Eagle* fly.

Clayton, 33, is a former ad executive turned diver/photographer. He says he bugged Giddings for two and a half years before being ushered into the inner circle as a volunteer. Presumably, Giddings spotted talent; but it is just as likely that Clayton's determination touched a more responsive nerve.

It isn't hard to understand why Clayton and others have been drawn inexorably to the Giddings fold. *Eagle's* mission is universal in its appeal and irresistible to just about anyone concerned with the fate of the planet. And it is realistic. It is aimed squarely at what Giddings sees as the power base of American culture, those organizations and institutions which can change the course of history, not the least of which is the sleeping giant of the federal bureaucracy.

"We're going to influence world opinion about the oceans," Clayton says confidently. "We're all bound to this idea, Al's idea, of changing world consciousness."

It will begin this year. Planned are a series of 12 hour-long network TV specials focusing on the natural history

of an oceanic area, or a single topic. It's part of a five-year plan. *Eagle*, with a cruising range of 14,000 miles, will spend four months at various Pacific locations: Baja California; the Galapagos Islands; French Polynesia; New Guinea; Australia; Indonesia; the Philippines; Micronesia; Hawaii. This is a bare outline which will be expanded to include all the world's seas and oceans.

More than good television will come from these voyages. *Eagle* is also a modern scientific laboratory. Dr. Sylvia A. Earle, research biologist at the California Academy of Sciences, has been appointed chief scientist. In many ways, she carries as much clout as Giddings. According to a biologist who has followed her career, "She's plugged into the scientific community like IBM." Recently, Dr. Earle was appointed to two consulting posts by the International Union for Conservation of Nature and Natural Resources. IUCN represents no less than 48 governments, 109 governmental agencies and maintains a global network of 700 professionals. The Giddings-Earle collaboration is considered solid gold.

Giddings is as generous in praising her as he is when talking about the rest of the *Eagle* team: "They are extremely important to me, to our mission. I can't talk about this without talking about them, too."

Clayton, too, speaks in the collective. Like Giddings, he subtly personifies *Eagle* as if it were a galaxy of souls bound by a unifying principal. And that principal seems to be:

We are a watery planet, fragile and dependent. The sea is the regulator of life. We must save it. We can't survive without it!

In a way it echoes Cousteau, the

ageless Manfish. But Giddings flinches at any comparison. *Eagle* is somehow more direct, more purposeful, even more ambitious.

Standing at the helm, Giddings tells us: "The next 25 years may well be the most important in the history of man and the sea."

Clayton says *Eagle* isn't following the lead of Cousteau. "We're adding a new dimension," he insists.

Cousteau appears more introverted. His boldness is somehow softened by a reverential union with the sea. In 1951, after *Calypso's* first working voyage, Cousteau wrote: "What had gone before in our underwater adventure was merely adolescence. The big years were ahead... *Calypso* was a debutante in the coral paradise to which she would return again and again in the years to come."

Giddings is less lyrical, a lot more business-like: "I was motivated to search for a facility from which the highest quality film programs could originate... The whole idea is to create a more caring approach to the world's marine resources. This is my primary goal."

The big difference between Cousteau and Giddings is cultural.

"*Eagle* is really all-American," says an observer who spent a week with Giddings in Cuba where the *Eagle* crew was filming for ABC's *American Sportsman*. "It's all-American because it (*Eagle*) is bigger, more ambitious."

Eagle, at 221 feet with a displacement of 1,200 tons, almost dwarfs the 140-foot-long *Calypso*. And its spectrum of photographic and scientific facilities is unmatched.

For years Giddings envisioned working from a world-ranging vessel that would serve for the production of defin-

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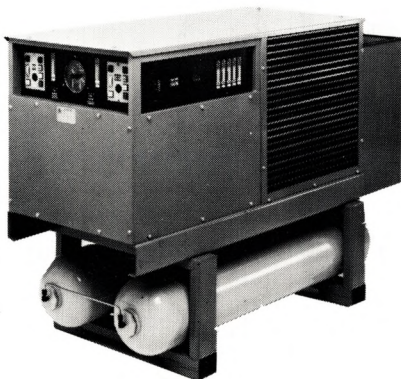


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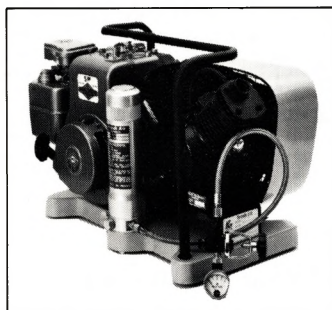
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R. V. EAGLE *continued*

itive natural history films emphasizing undersea exploration, conservation, and research. His search ended in 1975 when he found the Coast Guard training ship, *Tanager*. Sea Films took possession of the ship in March, 1976, and renamed it *Eagle*.

The first phase of conversion involved dismantling and removing unnecessary military hardware. During the first few months of work, more than 30 tons was removed, and two large stern compartments were converted for a photographic equipment and scientific lab.

In April, 1977, *Eagle* moved to Westwinds Shipyard, where additional superstructure and an upper deck house were added. About 52 tons of machinery was removed from the decommissioned aft engine room, providing space for a wet laboratory, aquarium room, and a complete machine shop. There are two photographic labs, along with an editing room, a sound room, twin libraries, a main bridge, flying bridge and a world-range radio room.

The vessel carries support dive boats, compressors, a double-lock recompression chamber, a compressed air/helium diving bell, a Kirby system, standard scuba and closed circuit systems. Deck hardware includes articulate cranes and winches, a helicopter landing pad and a hot air balloon launch and recovery system.

In its uniquely redesigned mode, *Eagle* is perhaps the world's most advanced support platform for marine research and underwater filming. In fact, the film lab is so extensive that *Eagle* will be capable of producing a near-finished network special—including scripting and sound—while at sea.

Early in 1977, *Eagle* served as a base for organizing a research and network film project documenting the songs and behavior of the Humpback Whale. Giddings and Dr. Earle collaborated with Dr. Roger Payne and Katy Payne on field work in Hawaii, an effort supported by the National Geographic Society, the World Wildlife Fund, the New York Zoological Society and the California Academy of Sciences.

Other projects involved articles for *National Geographic*, plus a special NG publication, *Ocean Realm*; and filming of an under-ice sequence for the Hollywood chiller, *Omen-II*.

These and other projects have helped fund *Eagle*. It is well to remember that Giddings has no real federal input or support. Cousteau, on the other hand, was assisted by a more than sympathetic French government. In America,

it is now up to entrepreneurs to make ocean study a reality. This means Giddings must run a tight, productive ship if the bottom line is to remain firm. TV production is a logical road to a healthy cash flow.

On the science side, enter the Ocean Trust Foundation, created by Giddings and Dr. Earle as a supplier of scientific support and talent. The non-profit Ocean Trust will act as a conduit for graduate students engaged in marine studies who will be given access to *Eagle's* unique research capabilities. Ocean Trust will also be a repository of all film shot by *Eagle's* crew, and a storehouse of raw and refined scientific data. The uncut film and data will be made available to the scientific community.

Christopher Dann, Director of Ocean Trust, says the organization's programs will encompass the entire marine environment with strong emphasis on man-in-the-sea approaches to research.

The Boston-born Dann, 36, came to the conservation field after an earlier career in broadcast public relations. Prior to joining OTF he ran the World Wildlife Fund. Working with Giddings, Dann sees the role of Ocean Trust as "world-wide, world-influencing." Administering a series of research internships, a com-

plete research library and supplying scientific and technical advisors, the organization is seen as *Eagle's* scientific right hand.

We asked Dann to estimate the value of *Eagle*, realizing the answer would be subjective.

"Its value is enormous," says Dann. "We feel, actually, that it's invaluable."

He said the vessel has been brought to its present state-of-the-art for about \$1 million, a price tag which has been kept relatively modest by the crew's willingness to do a lot of work on its own. But, says Dann, *Eagle* may be worth eight to ten times more in cold cash.

Its value to small non-profit research groups simply can't be gauged, however. Dann says *Eagle* will place highly sophisticated tools in the hands of such groups on a reasonable basis, circumventing the usually prohibitive costs of ocean research.

Success in achieving responsible world ocean policy will depend on "aggressive private initiative," he says, and this initiative will aim at two objectives: learning much more than we now know about the sea and communicating broadly and effectively what is learned aboard *Eagle*.

"If we achieve these two objec-

tives, the results will be persuasive scientific research independent of vested and narrow interests," according to Dann.

He adds that when the public is sufficiently aware of the importance of a healthy marine environment, responsible policies will be written. This is what he calls "intelligent commitment" to public policy.

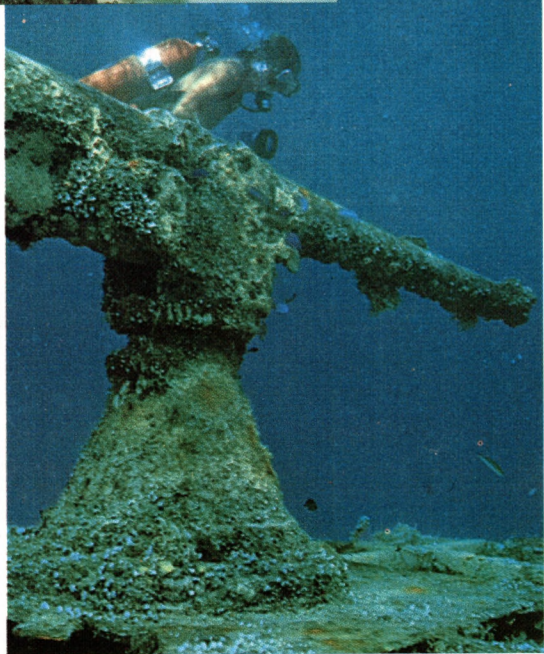
Eagle is nearing the end of its three-year conversion. Soon it will embark on the first of its baseline marine studies, studies made to stand up to ocean-to-ocean comparisons.

"We're coming down the home stretch," says Walt Clayton, "and I think that more and more Al Giddings, underwater photographer, will become Al Giddings, director."

Recently, Giddings said: "I would estimate I've logged 1,300,000 miles." That's quite a record, even over a 30-year career. But it may only be a prelude. For Al Giddings, underwater photographer, soon to be Al Giddings, director, may be racing toward a still more profound role: Al Giddings, U.S. Ambassador for the world's seas.

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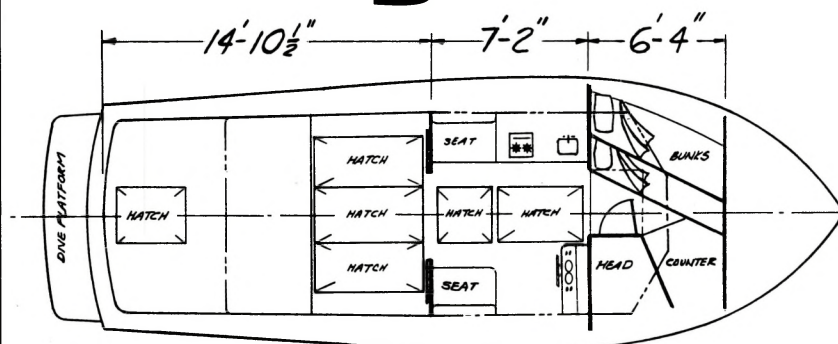
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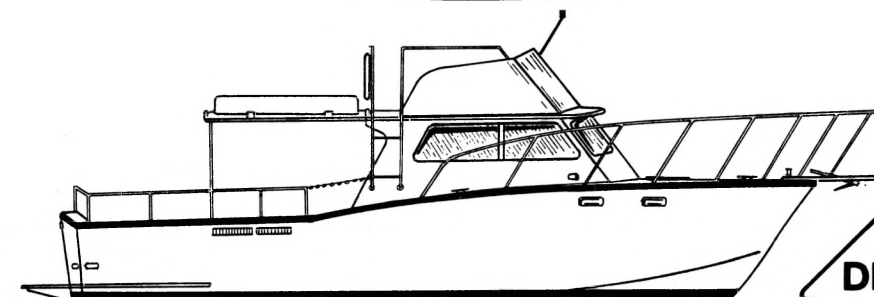
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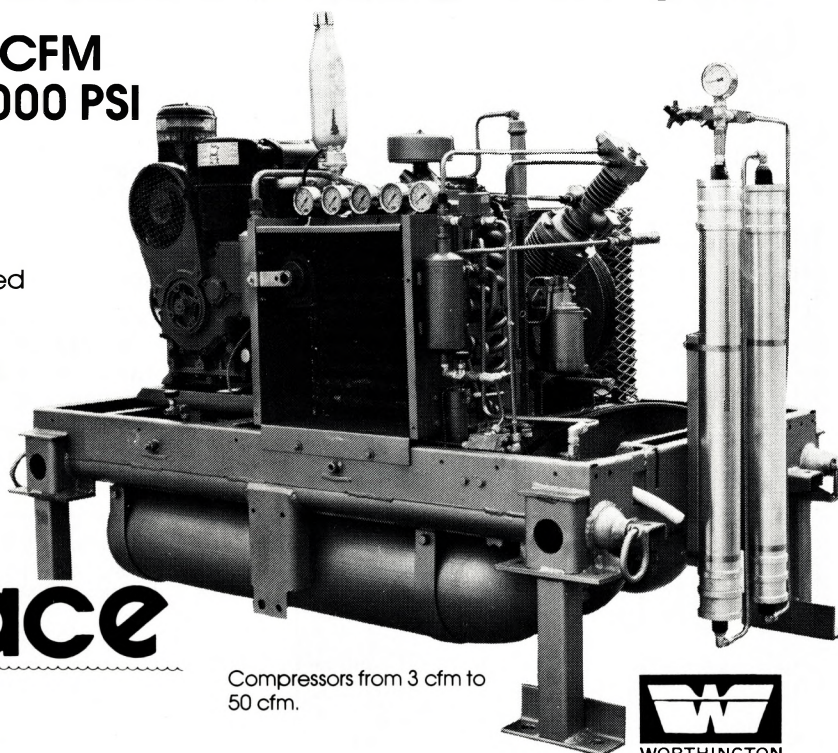
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The sea turtles of Palm Beach are almost as well known as the fun 'n' sun reputation of this Southeast Florida resort area.



Palm Beach County

There's a whole lot more to Southeast Florida than West Palm Beach.

BY TOM MOUNT

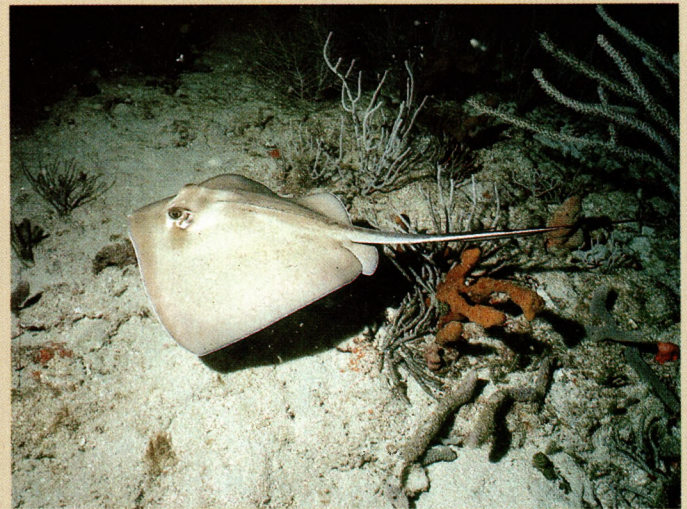
West Palm Beach, Florida has received a lot of attention from divers and diving periodicals. So much that many of its better dives—the *Mispah* and the *Breakers* for instance—are familiar names to divers who have never visited the area.

Yet West Palm is merely the central point in the section of the Florida reef that parallels the shoreline of Palm Beach

*Tom Mount is a past Training Director of the YMCA's underwater activities program and author of *Practical Diving*, *Safe Cave Diving* and *The Cave Diving Manual*.*

continued

Rays are fairly common off Palm Beach County, although they are not often seen by divers due to their protective coloration and nocturnal habits. This medium-sized ray was photographed on a night dive (right). The full range of Caribbean tropicals may be found here, from butterfly fish (opposite page, top), to graceful queen angels (center left), to trumpet fish (bottom right). There are also numbers of barracuda present, particularly around the Mispah wreck. The wreck is part of an artificial reef, and while the interior is a little silty for photography, it's fun to explore (bottom left).



County. From Jupiter in the north to Boca Raton in the south, the reef is virtually unbroken, a continuous line of diving discoveries.

Land facilities, charter services, reasonably priced accommodations and good restaurants are all available within convenient distance of almost any of the county's dive areas.

Due to the number of divers and diving operations in Palm Beach County, the reefs often have several names. Those listed here should be recognized by most local operators.

From Boca Raton, it is easy to reach Abbey Too and the Hillsborough ledges. Abbey Too is a 65-foot dive, usually done as a drift dive. The area features brilliant sponges and a rugged reef structure. It's exciting, and usually an ample supply of lobster can be found.

Hillsborough Ledges, however, hold the real lobster diver's delight. Located in 45 feet of water, the Ledges make a great repetitive dive after a turn on one of the deeper reefs. Clothed in soft corals, sponges and algae, the Ledges generally have 30- to 60-foot visibility. Local divers claim there's a bug behind every rock.

To the north of Boca Raton, the reefs off Boynton Beach usually have very good visibility over rugged and scenic coral growth or rock. At Lynn's Reef there are deep ledges with plenty of soft corals and brilliant sponges. Visibility is normally very good and excepting the current, conditions here are similar to those found many places in the Bahamas. The current usually dictates a drift dive and the average depth is around 70 feet.

The Plateau is an area covered with yellow, red, green, and brown sponges. The profusion and combination of colors make the reef almost gaudy, although the growths serve as a natural habitat for schools of butterfly fish, trunkfish and rock beauties. The absence of noticeable current here usually allows a stationary dive.

The Outer Ledge of Boynton Beach is a well-known and popular site. The large ledges support a heavy growth of sponges and are home to an occasional eagle ray, turtle, or large moray. The Ledge makes an exciting initial dive as its 80- to 90-foot depths limit bottom time and repetitive diving.

Lake Worth Pier and No Name Reef may both be reached from Boynton Beach. Bottom at both areas is at 45 to 65 feet.

The best publicized diving in Palm Beach County is offshore of West Palm Beach and Riviera Beach, where there are numerous locations within minutes of the dock. Some of the more popular sights include the *Mispah*, Double Ledges, Breakers, and the Gulleys.

The *Mispah* is a fish preserve, a wreck sunk specifically as an artificial reef. No spearing or surface fishing is allowed on the wreck, which lies in 90 feet of water, and as a result, the boat is home to a large and diverse population of fish. Schools of jacks, chub, and barracuda frequent the wreck, along with the occasional grouper or moray. The *Mispah* is a challenging dive, protected by strong currents. Responsible charter services usually will not dive the wreck with novices when the current, which can exceed three knots, is running strong.

The Double Ledges provide an excellent drift dive, allowing the divers to float over colorful sponges, morays, small nurse sharks and large sea turtles. There are many tropicals here as well, and the effortless sensation of viewing the abundant life while exerting very little effort is quite unique.

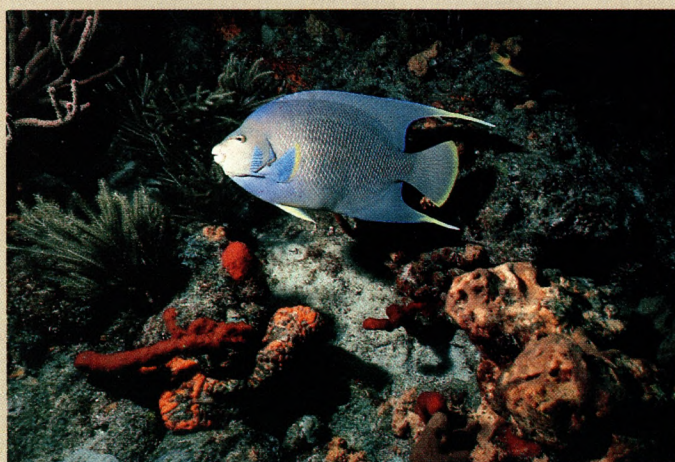
Another good drift dive is the Gulleys located in 80 feet of water. Turtles, schools of angel fish, rays, and the variety of corals and sponges in a dramatic setting make it a desirable photographic dive.

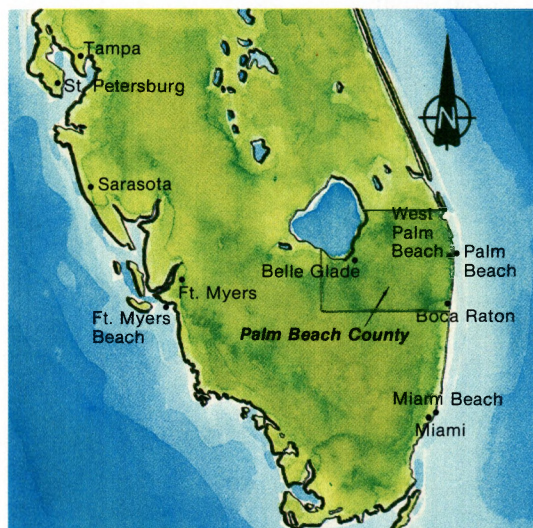
The Breakers, perhaps due to its proximity to Palm Beach Inlet is one of the best-known of Florida's reefs. In 50 feet of water, divers find turtles, schools of spade fish, barracuda and a variety of small tropical reef fish. As the current here is slight, the diving stationary, the area is often used to give students their first ocean dive. Plenty of bottom time, good visibility and generally excellent conditions have made the Breakers a local and regional favorite.

These are only a few of the more popular sites along the Palm Beach County shoreline. There may be other names for some, certainly there are areas with excellent conditions, good growth and large fish populations that are not described here. There are some spots, such as Lloyd State Recreation Area, where dives can be made from the beach, although generally, a boat is needed to reach the really prime spots.

There are areas where dives can be made right off the beach, although generally, a boat is needed to reach the really prime spots.







PALM BEACH COUNTY

GENERAL

Location: 60 miles north of Miami and 130 miles southeast of Orlando
 Size: 2,578 square miles
 Topography: flat with sloping beaches
 Climate: subtropical with 5.65 inches of precipitation annually
 Population: 570,629
 Largest towns: capital West Palm Beach
 Languages: English
 Ethnic composition: 60% Caucasian; 40% Black
 Economy: 10% agricultural, 30% industrial, 60% tourism
 Monetary unit: U.S. Dollars
 Diving season: all year
 Tourist season: all year

DIVING

Water temperature: winter 74°, summer 84° F
 Visibility: 50-60 feet, rainy season Sept-Oct reduces visibility to 30-40 feet
 Depth of dives: 60-90 feet
 Currents: 1/2-2 knots
 Tidal fall: 3 feet
 Types of diving: reef, wreck, night, drift, beach
 Skill level: novice, intermediate, advanced, hazardous
 Dives per day: 3
 Diving craft: excellent
 Sights:
 Fish: groupers, jacks, eels, angelfish, turtles, nurse sharks, tropical reef fish
 Coral: brain, star, soft, staghorn
 Sponges: tube, basket, seafans, seawhips
 Shells: conch, fighting conch, pecten, murex
 Invertebrates: nudibranchs, jellyfish
 Restrictions: none

DIVING SERVICES

Instruction available: resort course, open-water certification, advanced open-water certification, underwater photography, instructor clinics
 Equipment rental: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC, BC with inflator, pressure gauge, depth gauge, compass, decompression meter, full wet suit, partial wet suit, knife, game bag, dive light, Nikonos, camera housing, underwater strobe
 Equipment sales: mask, fins, snorkel, weight belt, weight, tank, backpack, regulator, safety vest, BC, BC with inflator, pressure gauge, depth gauge, compass, decompression meter, full wet suit, partial wet suit, knife, game bag, dive light, Nikonos, camera housing, underwater strobe
 Equipment repair: excellent
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 Guides: excellent

DIVERSIONS

Ground transportation: bus, taxi, rental car, motorbike, bicycle
 Shopping: excellent and reasonable
 Restaurants: excellent and reasonable
 Nightlife: excellent
 Other sports: water skiing, golf, tennis, horseback riding
 Don't Miss: There are a number of attractions nearby, such as Lion Country Safari

JUST IN CASE...

Hospitals: Good Samaritan, 1300 North Flagler Drive, West Palm Beach, FL 33402—Phone: (305) 655-5511
 Diving doctors: Bayard Moffitt, 509 U.S. Highway 1, Lake Park, FL 33403—Phone: (305) 848-5526; 842-4261
 Recompression facilities: Inter-City First-Aid Squad, 640 Old Dixie Highway, Lake Park, FL—Ph: 842-0583. Treatment Supervisor: Bob Gordon—622-3719
 Police: 655-3211
 Marine Rescue: Coast Guard—844-5030
 American Express: 247 South County Road, Palm Beach, FL 33480—Ph: 659-3622
 U.S. Consulate: N/A

PLANNING

Diving tours: Boca Dive Shop, 251 N. Federal Hwy., Boca Raton, FL 33432; Diver's World Undersea Center, 2525 Lake Dr., Riviera Beach, FL 33404; Frank's Dive Shop, 301 E. Blue Heron, Singer Island, FL 33404; Inlet Dive, 1940 N. Federal Hwy., Boynton Beach, FL 33435; John Larsen, 1000 Prosperity Farms Rd., N. Palm Beach, FL 33408; Nautilus, 877 E. Palmetto Park Rd., Boca Raton, FL 33432; Norrine Rouse Scuba Club of the Palm Beaches, 4708 N. Dixie Hwy., West Palm Beach, FL 33407; Reef Dive Shop, 304 E. Ocean Dr., Lantana, FL 33462; Seapro Scuba Center, 3619 Broadway, Riviera Beach, FL 33408; Wreck Dive, 5905 N. Federal Hwy., Boca Raton, FL 33432.
 Land tours: See your travel agent
 On your own: Airlines—Delta, 201 Alhambra Circle, Coral Gables, FL; Eastern 4890 N.W. 36 St., Miami, FL; Air Florida, 3900 N.W. 79 Ave, Miami, FL; National, Miami International Airport, Miami, FL
 Airports: West Palm International Airport, 683-5722
 Cruise lines: none
 Marinas: Rybovich Marina, 4210 North Dixie Highway, West Palm Beach, FL 33407—Ph: (305) 848-8672; Gulf Stream Marina, 2280 North Federal Highway, Boynton Beach, FL 33435—Ph: (305) 732-7556; Waterway Marina, 2361 PGA, Palm Beach Gardens, FL—Ph: (305) 626-0200
 Accommodations: See your travel agent
 How much cash may you bring into the country? N/A
 Export restrictions: N/A
 How much native currency may you take out of the country? N/A
 U.S. Customs re-entry restrictions: N/A

RESORT GUIDE

FRANK'S DIVE SHOP AND CRUISES— WEST PALM BEACH

301 E. Blue Heron, Singer Island, Fla. 33404. Phone: 305-848-7632.

RESERVATIONS: Captain Frank Hammet, 301 East Blue Heron, Singer Island, Florida 33404. Phone: 305-848-7632. For information on hotels in the Palm Beach area: West Palm Beach Chamber of Commerce, 501 North Flagler Dr., West Palm Beach, Fla. 33404. Phone: 305-833-3711.

LOCATION—Dive Shop is at the East entrance to Singer Island Bridge, within walking distance of center of town. Boats docked at Moffitt Inlet Marina, three blocks South of shop. Six miles East of Palm Beach Airport.

TRANSPORTATION—Air: Eastern and Southern from Atlanta, Air Florida from major Florida cities. Ground: taxi from airport to dive shop \$6, car rentals available at airport.

ACCOMMODATIONS—Six hotels located within a 3-mile radius of the dive boats range from first class to economy, offering a total of 700 rooms. Restaurants in area offer some of the finest seafood on east coast of Florida.

DIVING AVAILABLE—

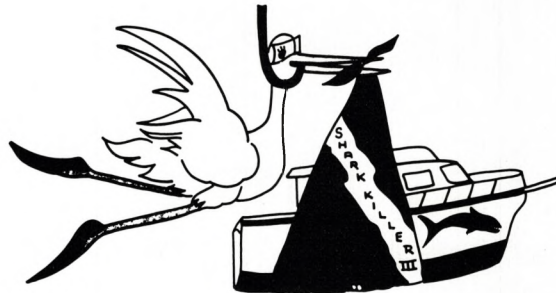
Shallow reef (5'-33') yes	Walls yes	Drift dives yes
Mid reef (33'-66') yes	Wrecks yes	Night dives yes
Deep reef (66'-99') yes	Caverns yes	Beach dives no

DIVING EQUIPMENT—Two Worthington Compressors, 5000 PSI. Forty tanks. 2 boats include new 48-ft custom Marine Management with a 49-diver capacity. Oxygen on board. Full service retail sales. Rental gear available. Underwater camera rentals available on arrangement.

DIVING SERVICES—PADI and NAUI affiliation. Two instructors and four dive masters, first aid/CPR trained. Resort course \$40, full certification course \$75. Advance diving, Underwater photography, and spearfishing courses available. Cost for one-half day diving is \$16, full day \$25, night dive \$15. There is no equipment included in the dive cost.

DIVING PACKAGES—Cost for a full day of diving is \$25. Shark hunts are available on request. There are daily scheduled trips to reefs and wrecks.

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PHYSIOLOGY

We Need More Trained Physicians

If you have an accident, will there be a trained diving doctor nearby? Odds are there won't.

BY BRUCE BASSETT, Ph.D.

Diving medicine? Diving physiology? Sure—that means things like squeeze, hyperventilation, air embolism, shallow water black-out, bends. You learned about them in some detail in your basic, advanced, or instructor certification course. Because of those courses you, the diver or instructor, know more than probably 95 to 99 per cent of all practicing physicians about the potential medical or physiological problems, their causes, manifestations, first aid, and even definitive treatment.

Why? Because, with rare exception, the subjects of diving and hyperbaric medicine and physiology are not included in medical school curricula. This explains why you, or your diving acquaintances, may have had one or more of the following problems.

Diving Physicals

When you first signed up for a basic scuba course, you were informed you must have a diving physical and were provided a form to give to your physician. If you were lucky, your instructor also gave you the name of a knowledgeable physician in your area.

On the other hand, such a recommendation may not have been made, and you may have encountered a physician who informed you that diving was dangerous and your medical history was contraindicative of diving. If you were really turned on to diving, you may have sought a second or even a third opinion.

Dr. Bruce Bassett has been actively involved in diving medical education since 1964. Currently, he is a Lt. Colonel in the Hyperbaric Medicine Division, USAF School of Aerospace Medicine.

If you are an instructor, you may have had a basic scuba student in your class, who during your diving medicine and physiology lectures came to you and wondered why you mentioned asthma or epilepsy or some other contraindication to diving, since they have that condition and a signed form saying it is medically okay to dive. What you may have done or what you may do when faced with this situation largely depends on your own knowledge and whether or not you know a "diving doc" who can advise you or your problem student.

Diving Emergencies

You are diving with your buddy at 30 feet and something snags his buoyancy compensator inflator cord. You see him heading for the surface at a rapid rate while fumbling for his oral inflator. You reach the surface and find him floating face up, breathing but unconscious. You get him to shore and with help get him out of his gear and into a 30 degree head low position while another diver calls for an ambulance. During the time it takes for the ambulance to arrive your buddy regains consciousness, has a seizure, and then develops right side paralysis, severe mental confusion, and complains of a severe headache. When the ambulance arrives you insist that your buddy be transported in the head low position and have oxygen administered.

A textbook case of air embolism? Right. Proper first aid applied? Right again. But now you arrive at the emergency room of the local hospital and your buddy is whisked off to an examining room while you are questioned by some administrative type regarding names, nature of the accident, next of kin and so forth. When you catch

continued

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PHYSIOLOGY *continued*

up with your buddy he is no longer in a head low position, no oxygen is being administered, and the attending physician is attempting to question your totally confused friend about what may have bitten or stung him, what medications or drugs he has been taking, and is ordering blood gas studies and a chest X-ray!

When you finally get the physician's attention and mention a recompression chamber you get a blank stare. When you describe the history of the dive and the accident he mumbles something about near-drowning, venomous creatures and then, after a period of obvious memory searching, a look of astonishment comes over the physician's face and he asks you, "Do you think he has the bends?"

This fairy tale could go on. You might be able to convince the physician that you know exactly what the problem is and what needs to be done; or you might be dismissed summarily—banished to the waiting room.

Unfortunately this is merely the fictionalization of real cases. Anyone who has been in the field of diving medicine and recompression chamber operations has heard them time and time again. Who knows how many cases have never come to the attention of knowledgeable individuals? I know personally of one case of spinal cord decompression sickness that was originally diagnosed in the receiving emergency room as severe gastrointestinal gas pains, which would probably be relieved by "passing gas." This diver is still in a wheelchair.

The Solution

Obviously, it is education. It would be great if diving and hyperbaric medicine and physiology were included in every medical school curriculum—perhaps one day they will be. In the meantime, there is Continuing Medical Education, known as CME.

More emphasis is now being placed on CME for physicians by the national, regional, state and even local medical societies. In many states, physicians must accumulate a given number of CME credits in a specified period of time to maintain their certification.

Over the past few years, a concentrated effort has been made by several authorities and educators in the field of diving medicine and physiology to provide meaningful, viable, and fully-accredited programs for physicians of all specialties throughout this hemisphere.

If you read the diving media or

medical journals, you will find program descriptions and calendar listings for programs conducted each year throughout the Bahamas, Caribbean and South Pacific Islands. While at first glance you may have thought the sudden appearance of such listings indicated some sort of gimmicky, tax-deductible boondoggle for vacationing diving physicians, I can assure you this is not the case.

These programs are being offered to meet a need, and to ultimately benefit you, the diver. In addition to making more physicians knowledgeable with respect to performing diving physicals and in the recognition and management of diving casualties, such programs foster active involvement of diving physicians in diving education and safety at the local level.

The Undersea Medical Society

Behind this sudden surge in diving medicine programs is the Undersea Medical Society, Inc., (UMS), specifically their Education Committee. This society, which is dedicated to the entire spectrum of human underwater activities, and which includes over 2,000 members and associates throughout the world, established guidelines for the education of physicians and paramedical personnel in the areas of diving medicine.

The UMS is the only organization recognized by the American Medical Association for the granting of CME accreditation for programs in diving medicine. The process of attaining accreditation does not consist of merely asking for it. A detailed curriculum, lesson plans, curricula vitae for all staff members, and a sample final examination must be submitted for approval a minimum of three months before the program is scheduled. This means, with a minimum of three months promotional lead time, the program must be submitted for approval at least six months in advance. Further, the program must be resubmitted for certification every three years, and must be audited by a member of the UMS Education Committee at least once every three years. At present there are only a handful of programs that have been fully accredited.

The UMS has become more attuned to the needs of sport divers and indications are that this will prevail and even increase in the future. Not only does the UMS sponsor educational programs for physicians, it has also conducted workshops which have been of importance to the sport diver. Workshops, for example, have been conducted on the subjects of decompression sick-

continued



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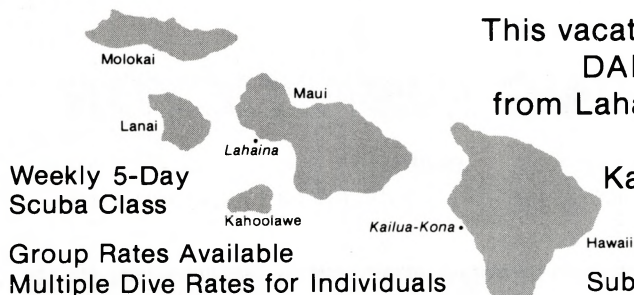
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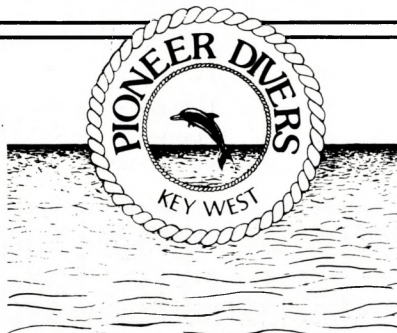
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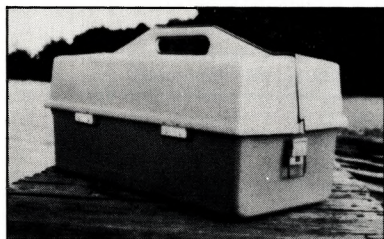
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PHYSIOLOGY *continued*

ness, air embolism, and their treatment; the controversial subject of emergency ascent training of sport divers; and pregnancy and diving.

Finally, sport divers with particular interest in diving medicine and physiology, even without advanced degrees in these subjects, can now join the UMS as Associates. Associates are, of course, invited to attend the annual scientific meeting and to participate in regional chapter activities as well. At present, there is one active chapter, the North Pacific Chapter, and one in formation, the Gulf of Mexico Chapter.

There is also student (undergraduate) membership status for those pursuing degrees in a field related to any of the several underwater biomedical disciplines. Of course, divers who already possess degrees in any of these disciplines are encouraged to apply for regular membership status. For further information on the Undersea Medical Society, contact this author in care of: Human Underwater Biology, Inc., P.O. Box 5893, San Antonio, Texas 78201 or contact the UMS at 9650 Rockville Pike, Bethesda, Maryland 20014.

The Future

Diving medicine is growing, largely through the efforts of the Undersea Medical Society and a number of dedicated educators who are attuned to the needs of the entire diving community — which, of course, includes the largest group of divers, sport divers. Because of these educational efforts, the future holds the promise of fewer and fewer of the problems described in the beginning of this article. Developments in the related field of hyperbaric medicine, which will be covered in a future issue of *Sport Diver Magazine*, may lead to installation of more recompression chamber facilities, with the obvious benefit to sport diving casualties.

For diving instructors, there will be a larger body of physicians educated in diving medicine in your community to call on for advice, to refer your students to, and to call on for educational assistance in your teaching programs. Even now, you may contact the UMS and obtain their membership directory. This will put you in touch with knowledgeable physicians in your area.

And finally, this crystal ball gazer predicts that the trend toward more emphasis on the part of the UMS concerning problems in sport diving will lead to an overall improvement in the safety of our sport.



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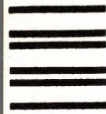
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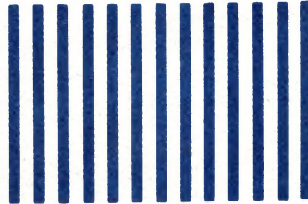
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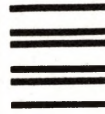
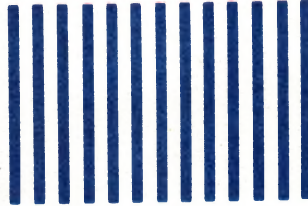
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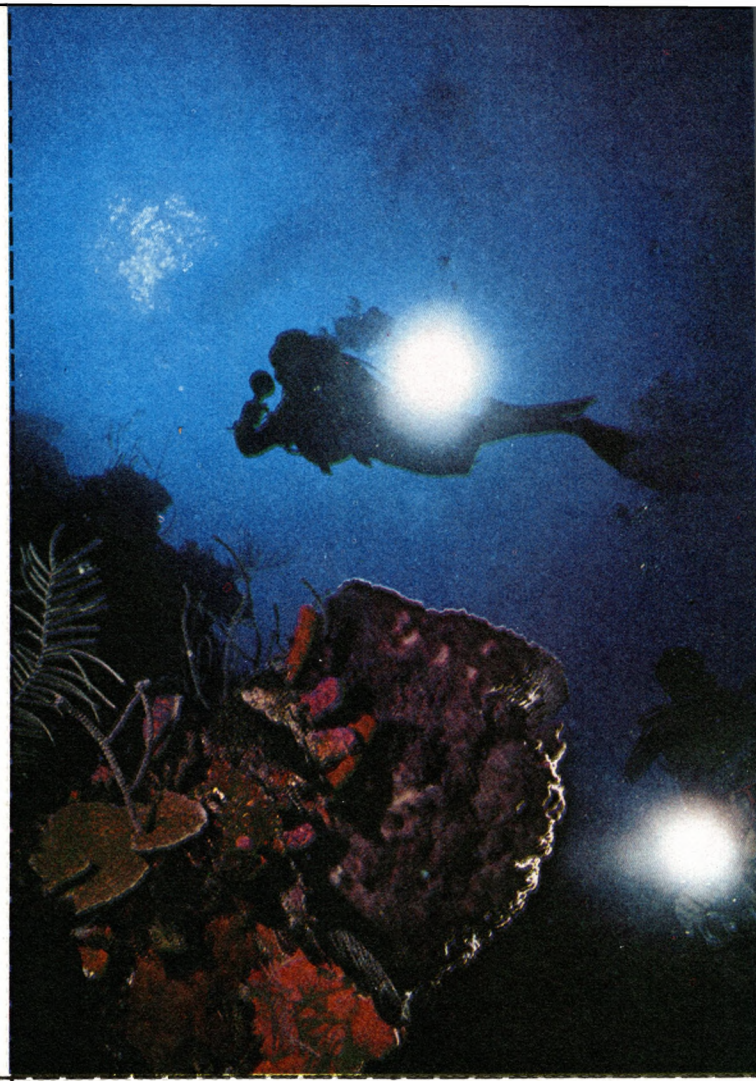
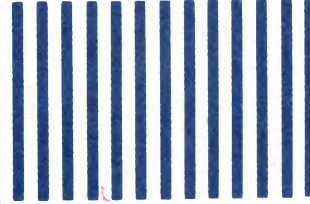
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THE EDIBLE SEA



The bright, highly polished shells of *Strombus gigas* (Queen Conch) are commonly used to make decorative planters, lamps and ash trays. There is another, better use for the gastropod—as the base for delicious chowder, fritters or steaks.

STEVE BLOUNT

Queen Conch

BY PAUL HILL

There is a large marine snail that provides delicious meat for many gourmet recipes; produces a valuable shell for decorative and practical products; has economically sustained a whole nation for centuries; jumps instead of crawling like other snails; is shaped so that it can be blown like a horn; is a collector's item; and sometimes produces valuable pearls. This incredible snail is the queen conch.

To the yearly visitors of Florida and parts of the West Indies, the queen conch offers a delightful culinary adventure. Conch in any form is a delicacy. Seasoned with native lime, hot peppers, and salt, then garnished with onions, sweet peppers, and other vegetables, the conch

is transformed into salads, chowders, appetizers, fritters, and entrees.

To natives of the Bahamas, the chewy conch plays a major economic role. For centuries—through periods of economic depression as well as booming prosperity—the conch has sustained the Bahamian people and intrigued visitors.

The conch is more closely associated with the Bahamas' national identity than any other fauna of this vacation area. Many early settlers came to Florida and the Keys from the Bahamas and their descendants are often called "Conchs." Although the term has been used as an insult Bahamian natives consider it a compliment.

The conch (pronounced konk) is a marine gastropod (marine snail), distributed world wide in tropical and semitropical seas. Conchs are most often found between the reef and shore in areas where they have not been heavily collected. Protected by a large heavy shell, the conch lives in the sandy areas or grassy beds which provide food.

All conchs are edible, however most are small and produce very little meat. The conch most often used to make tasty

salads, steaks, and chowders is the large queen conch (*Strombus gigas*), also called pink conch. Its range includes southern Florida and parts of the West Indies and often grows to 12 inches. The milk conch (*S. costatus*) of Florida and the West Indies is similar to the queen conch but grows to only six inches, has a cream-white lip and no knobs on the spire.

Of all conchs, the Florida fighting conch (*S. alatus*) is the one you are most likely to find. It grows to only three inches and it takes a lot to make a meal.

The Florida horse conch (*Pleuroploca gigantea*) is a member of the tulip conch family. Its orange flesh is edible but has a peppery flavor. One of the largest living gastropods, it can grow to a length of two feet. Unfortunately, the two-footers are rare due to overcollecting.

The queen conch has a very attractive and durable shell. The shell is thick, has a sharp spire, and the whorls are heavily armored with blunt spines. A large, flaring lip appears after the animal has reached sexual maturity. Smaller shells without the flared lip are called "rollers" and should not be taken.

The queen conch moves the cum-

continued
157

Paul Hill's book, *The Edible Sea*, is considered the reference for recipes among divers.

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EDIBLE SEA *continued*



RICK FREHSEE

bersome shell by thrusting its massive body over the bottom in grotesque leaps and tumblings. To start a move, the conch stretches its body forward, and thrusts its sickle-shaped operculum claw into the sand below the shell. Then, as it digs down with the operculum, it gives a sudden push and leaps ahead, often tumbling and rolling before it can get balanced for another leap.

When anticipating a meal, the conch will engulf its victim with its large foot much like chocolate coating slowly covering a nut. After digesting the meat, the conch discards the victim's shell.

The shell of the queen conch is used in a variety of ways, and is hoarded as a collector's item. Various shades of pink tinged with white, the shells are used as ornaments, vases, plant pots, horns, buttons, beads, ornamental cameos, and as an element in the manufacture of terrazzo floors and house partitions. Highly decorative and durable, the shells are used on the outside walls of houses as well as inside, creating impressive decor.

Valuable pink pearls are sometimes found in this spectacular conch. In the past these pearls have fetched a small fortune, and a well-known pink pearl connoisseur contends that the pink pearl has become very rare, thus enhancing its market value.

The pearl is embedded in the flesh of the conch, and there is no external evidence of the contents. Most pearls found are not considered very valuable.



STEVE LUCAS

Although the Queen Conch is common to many Caribbean reefs, the larger individuals are rare. This is partially due to overcollecting by shellers and to overfishing by natives. In some remote areas large conchs may still be found, but with the increasing numbers of underwater collectors and the increasing range of native fishermen using modern gear, even these preserves are threatened.

They have odd shapes and vary in color; white, yellow, and sometimes red.

The most valuable pearl possesses a subtle rose color, is oval in shape with wavy, undulating markings. It varies from pin-head to pigeon's egg.

The rare pearl is formed when a foreign object swims or drifts inside the conch shell and irritates delicate tissues. The conch responds by walling off the object, secreting layer after layer of mother-of-pearl around the nucleus.

For thousands of years, shell horns have been used for signalling. The shell horn is made by cutting off the end of the spire or making a round hole in the side. Then about a half-inch of the obstruction in the center of the hole is chiseled out. The sound is made by pressing the lips against the opening and blowing as trumpeters do. Experienced horn blowers can produce a mellow, penetrating tone. The larger the shell, the deeper the tone.

For the inexperienced, removing a conch from its shell can be frustrating, although a Bahamian fisherman will do this swiftly and deftly. A large, heavy-bladed knife is used to cut the muscle through the shell near the vortex. This will release the animal from the shell so that it can be pulled out easily.

As with many gastropods, only the foot, or muscle, is eaten. The cleaning is completed by cutting away the soft viscera, the skin, and the operculum.

The flesh of the conch can be used in a variety of ways; chopped for salads,

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ground for chowder and fritters, or tenderized for steaks. It can also be dried.

The flavor and texture of conch meat is similar to abalone, and abalone recipes can be used for conch. Whether you have the East Coast conch or a West Coast abalone, the following recipes will enhance your catch.

Conch Steaks

Slice the foot into quarter-inch steaks and pound with a mallet to break down the tough muscle fibers. Place the steaks between sheets of wax paper and let them age in the refrigerator for about 24 hours. If you can't wait, dip steaks in beaten eggs and cracker crumbs. Fry quickly on each side until golden brown; about 30 seconds on each side. To deep-fry, heat oil to 390°. Don't overcook. Drain and serve while hot.

To vary the flavor, marinate conch in lime juice or teriyaki sauce for about one hour before frying.

Keys Conch Chowder

There are many versions of conch chowder. This one is simple and good.

- 1/4 pound salt pork, diced
- 3 large potatoes, diced

- 2 onions, chopped
- 4 garlic cloves
- 1 green pepper, chopped
- 20-ounce can tomatoes
- 6-ounce can tomato paste
- 4 bay leaves
- 2 quarts boiling water
- 1 tablespoon lime juice
- salt and pepper
- 4 cups ground conch meat

Brown salt pork and then brown potatoes. Add remaining ingredients except the conch meat. Cook 30 minutes. Add conch meat and simmer for 15 minutes. Makes about 5 quarts.



PAUL HILL



FLORIDA HORSE CONCH
Pleuroploca gigantea

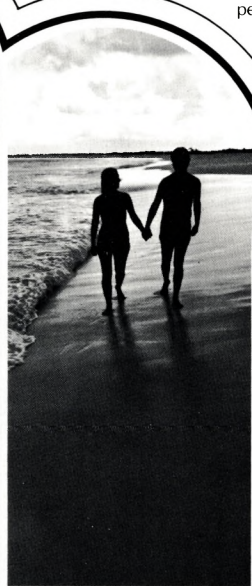
To remove a conch from its shell, use a large, heavy-bladed knife to cut the muscle through the shell near the vortex. This operation may take a while for the inexperienced, but with practice, anyone can learn to open the mollusks with the dispatch of a Bahamian fisherman. After opening, tenderize the meat by pounding with a mallet.

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This magnificent polychrome depicts the Mesoamerican water god, Tlaloc. The Mayas and other Mesoamerican groups often consecrated sink-holes, called cenotes, to Tlaloc. At the cenote Chichen Itza (right), the Mayas offered sacrifices, including humans, to the god. Divers have brought up a number of important artifacts from the bottom of the cenote.

Salvaging the Past:

MAYAN CENOTES

Clues to the mysterious demise of the Mayan culture lie hidden in the depths of their sacrificial wells.



BY DR. MIGUEL
GUZMAN-PEREDO

The world of the Maya, and the cultures which preceded them, has long been a subject of fascination. The scattered remains of their civilization lie buried in the dense jungles of Mesoamerica (Central America and Mexico). The finds uncovered to date have done little more than whet the appetites of the curious with cryptic clues: pyramids with base areas mathematically identical in proportion to those of Egypt; prosperous cities; centers of trade and high learning; and hints of murderous religious ceremonies.

A flourishing, heavily urbanized, intellectually diverse culture, the Mayas suddenly disappeared between the twelfth and fourteenth centuries, A.D. Over this 200-year period, their great cities fell into decay, and religious centers were destroyed by riots and starvation. The cultures which succeeded them have no mythology to explain how they

arrived in Mesoamerica, or what happened to the Mayas.

The archaeologists who attempt to reconstruct this puzzle have been severely handicapped by the lack of physical artifacts available for study. After the Spanish invasions and ravages by later treasure hunters, few easily-plunderable artifacts remain. Only those items hidden by the deep jungle—or deep water—have survived. Fortunately, the Mayas provided us with ready-made storehouses of artifacts, their ceremonial wells, where objects of value—including humans—were offered to the gods.

Water is life. It is a basic necessity of both primitive and modern settlements. Water gods occupy a preeminent place in the mythology of all primitive cultures. These deities are charged with obtaining rain and regulating supply.

Among the cultures of Mesoamerica, the water god had different names. Central Mexican languages translate him as Tlaloc, the name by which archaeologists know him. The Mayas called him Chac.

The primitive settlers of Mesoamerica were convinced their water gods

*Dr. Guzman-Peredo is a diver and historian, and is General Director of the Instituto Mexicano de Oceanografía in Mexico City. He is also author of *Underwater Archaeology in Mexico*.*



The finds uncovered to date have done little more than whet the appetites of the curious.

MAYAN CENOTES *continued*

lived in the high mountains, where clouds could be seen forming, storing rain for the lowlands. Their legend said that, when the little tloques, dwarf rain gods who obeyed Tlaloc, broke their jars, thunder was heard. The pieces falling to Earth caused the lightning.

The entire Yucatan peninsula is a limestone plain with no running streams. Its inhabitants are dependent on subterranean water deposits which accumulate under the porous rock. These deposits are only accessible where the limestone has collapsed, forming deep sinkholes, called cenotes (se-no-tes). Because these holes gave access to water, they were sometimes consecrated to the rain god, Tlaloc.

"Tlaloc is one of the easiest gods to identify," says archaeologist Alfonso Caso, "because of his characteristic mask. When seen from the front, it gives the impression that he is wearing a moustache and glasses. This mask is formed by two entwined snakes. Their bodies form circles around the eyes and join their fangs over the mouth."

The configuration of the god's face is derived from a combination of features of mythical figures: jaguar, serpent, bird and butterfly.

Chichen Itza was a great ceremonial center located about 75 miles east of present-day Merida, Mexico. The usurping family of Itza ruled the Mayas of this region with a heavy and burdensome hand. In the regional dialect, Itza came to mean "yoke." Chichen Itza was their ceremonial center, and it was the object of holy pilgrimages throughout the Mayan culture. Chichen Itza enjoyed its greatest splendor between the eleventh and thirteenth centuries, and then declined or was destroyed between 1200 and 1204 A.D.

There are two cenotes at this site. The first was called Xtoloc, and provided water for daily living, while the cenote which they called Chen Ku (sacred well) was predominantly used for religious purposes.

In order to honor Chac at the sacred well, the Mayas threw in offerings of gold, jade, polychromed ceramics, aromatic copal, rubber figurines, copper rattles—and humans.

The victims were generally young women. For each ceremony 13 were chosen. They were given a steam bath, and balche to drink, which made them slightly intoxicated, unheeding of their destiny. They were dressed in the finest robes, splendidly jeweled, and exquisitely perfumed. They were taken to a small temple at the west side of the cenote where they received the last purification rites.

What happened next is a matter of conjecture. One theory purports the victims were simply thrown into the cenote, another suggests they were killed first. They could be killed in one of two ways: decapitated; or hit on the head and their hearts torn out. Afterwards they were hurled from the platform on the south side into the water of the well.

Excavations at Chichen Itza have yielded the most diverse collection of metals discovered at any Mesoamerican site. Chemical analysis of metal objects found in the well show they came from as far south as Colombia and Panama, and as far west as Chiapas, Oaxaca and the Valley of Mexico.

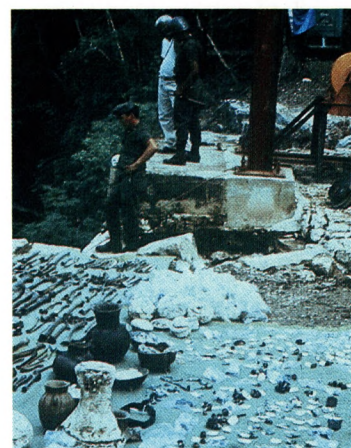
The first underwater expedition in Chichen Itza was carried out in December 1960, under the direction of Pablo Bush Romero, leader of the Club of Explorations and Underwater Sports of Mexico (CEDAM) and in conjunction with the National Institute of Anthropology and History.

Initially, an air lift was used to suck objects from the bottom. Although the procedure was effective, the work had to be abandoned because fragile objects and human bones were broken by the high pressure in the tube, and because it was impossible to keep an accurate stratigraphic record on the materials before they were removed.

In September, 1967, another expedition went to the cenote. Again, CEDAM



Using air lifts and scuba equipment, the explorers of the sacred wells of the Mayas have recovered artifacts which added greatly to the understanding of the Mayan culture. The jade goddess' head (above) is from the collection of artifacts brought up by Edward Thompson, an American who bought Chichen Itza for 200 pesos in 1894.



arranged to equip what has been, to date, the most successful exploration of Chichen Itza. This time the researchers pumped enough water out of the cenote to lower the water level by 12 feet. The area of the bottom exposed was then excavated in almost the same manner a land site would be worked.

Next, the water remaining in the pool was clarified and purified. The normally dark green water turned a beautiful turquoise blue, and underwater visibility allowed accurate stratigraphic plotting and recovery of artifacts by divers. A number of important finds were made at this time: two enormous serpent heads with traces of their original paint, two standard holders in the shape of jaguars, and two slabs from the walls of the ballcourt. In another spot, blue ceramic vessels containing copal, skulls, copper rattles and rings, and several intact vessels. A third site yielded gold rattles, gold and copper sandals, intact

vessels, balls of copal, wooden masks, skulls and human bones, gold plate and rubber balls.

The Spring of the Half Moon

In the state of San Luis Potosi, in the municipality of Rio Verde, there is a warm spring which, for a long time, has been known as the Half Moon, due to its shape. The Spring provides sufficient water to irrigate orange groves, corn, chilies, peanuts and sugar cane which are cultivated by the inhabitants. No doubt it has been used for this purpose for many centuries.

In 1967, divers explored the bottom of the well for the first time. They recovered many vessels containing small water god idols of the preclassic type. They also found bones of extinct animals.

It is obvious that the spring was used as a ceremonial well because many of the vessels recovered contained three or four idols carefully put in place. What



A flourishing culture, the Mayas suddenly disappeared.



At an altitude of two and a half miles above sea level, the lakes of the Volcano of Toluca may be the world's highest subaquatic archaeological site. Divers of the CEDAM have recovered artifacts from the Lake of the Sun (above) that indicate it too was used as a repository for sacrifices to the water god.

is not so obvious is how the large numbers of animal bones came to be in the spring. It is possible that the spring was, at one time, a great natural trap which swallowed up the animals. Another possibility is that the tribal group which settled around the spring may have thrown the bones of the animals they hunted into the spring.

According to archaeologist Beatriz Braniff, the objects recovered from the Spring of the Half Moon belong to a culture which is hard to identify. They may have pre-dated the Mayas by six to ten centuries. It is interesting to note that, even at this early time, perhaps 650 B.C., the region's inhabitants were offering symbolic sacrifices to their water gods.

Still a mystery

Although much knowledge of the Mayan culture has been gained, there is still no definitive reason apparent for the sudden decline and disappearance of these people. From clues supplied by the excavations at Chichen Itza and by other researchers, some archaeologists have

inferred that it was, ironically, rain which disrupted the Mayan society. Pollen records in the area show a drastic change of climate which coincides with the demise of the ceremonial centers and cities. A shift in the wind patterns in the upper atmosphere brought more rain to the area—an enormous change in the amount of yearly precipitation. Soon the semi-arid land groaned under the burden of a lush jungle, nourished by the wet climate. Vegetation quickly overgrew outlying farmland and the extensive system of roads built to transport food from rural areas to market in the cities. Resulting food shortages led to riots in the cities and ceremonial centers, and the population dispersed into the jungle. A society characterized by a large class of priests, intellectuals, and nobles became one of itinerant farmers in just a few short generations. Memory of its splendors soon faded, and today, the only remains of this great race are those which were buried under dense foliage—or lay under fathoms of murky, impenetrable water, sacrifices to the water god, Chac.





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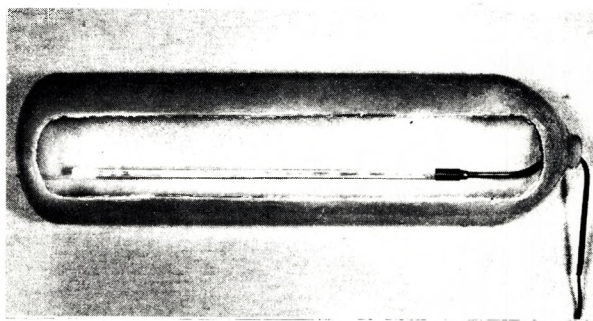
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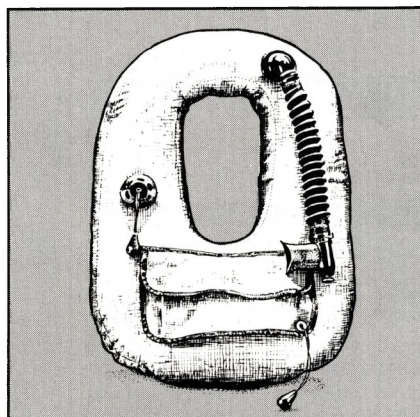
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Choosing A Buoyancy Control Device

BY DENNIS GRAVER

Today there are automatic BCs, back BCs, over-the-shoulder types, jackets, power deflators—so many models and options that divers are sure to be confused.

Have you shopped for a Buoyancy Control Device recently? Fifteen years ago the choice was simple. You bought a Rubber Fabricators life vest and tried not to use it because it was such a pain in the water.

Today there are back inflation BCs, over-the-shoulder types, jackets, under-the-arm designs, automatic BCs, power deflators—so many models and options that divers are sure to be confused when selecting a BCD.

Seeking advice probably won't end the dilemma because experienced divers, instructors and retailers can't agree on which type of BC is best. But that's to be expected because there is no BC which is ideal for all situations. Each type has characteristics which make it desirable at times. The "right" style for you should be determined by where and how you dive.

Back Versus Front Flotation

When diving from a boat, especially in the tropics, the integrated back-mounted systems seem to work well. Slip on mask and fins, jump in the water, don the unit and dive. It's simple, easy and comfortable. On the other hand, that type of system isn't best when the plan is to go off the beach free diving, ploughing through heavy West Coast surf. When compactness is not a concern the back-mounted system is acceptable, but when packing gear into a bag, a BC that can be stuffed into a small space serves best.

A front-mounted BC will be most comfortable if a great deal of surface swimming will be involved in a dive. Swimming on your back for long distances may produce a feeling of insecurity or a lack of orientation. You'll have to keep craning your neck to see where you're headed. There's also more drag

with back units and the tank underneath you could snag seaweed.

Your physical size and shape should be considered as well. On some people, many front-mounted BCs extend to the waist, leaving little or no room for weight belt and harness. In this case a short, small BC or a back-mounted unit may serve best.

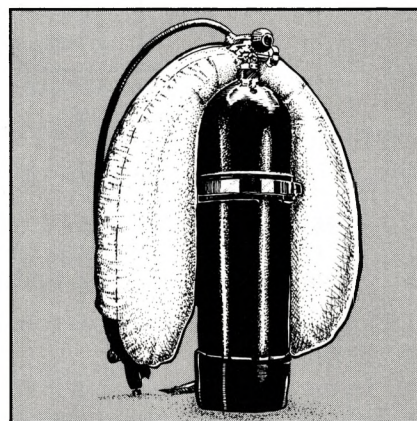
Finally, cost is always a factor. While the price of the integrated units is high, it is, in total, about the same as similar individual components purchased separately. By purchasing the components—backpack, BC, low pressure inflator and weight belt—the expense can be spread out over a longer period. Just remember that an initial investment in quality equipment will actually save money by precluding a second purchase after the diver realizes the cheaper gear won't do all that he needs or wants it to do.

CO₂ Inflators: Can You Trust Them?

The advantage of the CO₂ cartridge inflator is that it provides instant buoyancy in an emergency—assuming that it is in working order.

I have conducted tests of CO₂ inflators at instructor training courses in the Midwest and on both coasts. Asking instructor candidates to inflate their BCs by firing the cartridges, I found that the fresh water divers were successful 80 percent of the time, while salt water divers were successful in only 20 percent of the instances. Mineral deposits and corrosion from salt water have a significant effect on the mechanism.

The cartridge and firing mechanism require frequent maintenance. The BC must be rinsed inside and out, the CO₂ assembly must be rinsed and the cartridge inspected and lubricated regularly. The BC should be inflated occasionally using the cartridge or a "vest checker" to assure that the internal passageways are open. Most divers do not provide the maintenance necessary to as-



sure operation of the CO₂ inflator. If you intend to get one, plan to service it regularly.

There are some cautions related to the use of CO₂ inflators. The cord which activates the mechanism can be caught and pulled accidentally, leading to surprise ascents, panic and cursing.

Breathing high concentrations of CO₂ can damage your lungs, so be sure to purge the BC completely after a CO₂ inflation. One instructor inhaled CO₂ when the cartridge corroded through, inflating his BC at the exact moment he had the hose in his mouth for oral inflation!

In addition, the cartridges have been known to explode. Inspect the cartridge frequently and replace when corrosion is evident.

When a cartridge is fired, the metal casing gets very cold—well below freezing. So keep the inflator mechanism away from bare skin during inflation.

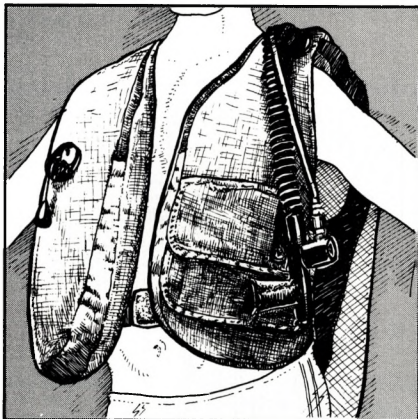
Remember, like any piece of machinery, the CO₂ inflator can serve well, but only if you give it the care it requires. Its reliability is directly proportional to the amount of attention you give it.

Weights

The diver's weight system is a primary safety feature which should be selected carefully. Some divers prefer weights integrated into a system, while others prefer to wear weights on a belt.

Special weights are used in some integrated systems. This can be bothersome if you drop or lose the weights or travel without them. You can wear a separate weight belt, but the unit's performance will differ because the center of buoyancy will have shifted. It's usually a chore to adjust the weight in an integrated unit so frequently this isn't done. The weights and releases require maintenance to assure they will eject properly. In some systems, the weights can only be released with one hand and require the diver be in an upright position.

Dennis Graver is National Training Director of the Professional Association of Diving Instructors and author of several books on diving, including Sportdiving A to Z.



A separate weight belt is not without its problems. It is one more belt, which can cause confusion. The weights can interfere with the tank in back, and the weights can slide around on the belt. Weight belts frequently rotate around the diver, locating the quick release buckle where it can't be easily found. The weight belt does not ditch easily and must be pulled clear of the diver and dropped. Finally, weights do occasionally come loose and fall off.

Emergencies

As in normal diving situations, there seems to be no single best flotation system for the diver in trouble.

I don't feel that whether or not a unit floats the diver face up is a big issue. I have studied hundreds of diving accidents, and I don't know of any where this has made a difference. Divers who have accidents are not buoyant. If they were buoyant they probably would not have the accident.

Back units are easily removed, provide a lot of buoyancy for rescuer and victim, and allow a rescuer to get quite close for resuscitation. Drawbacks of back units include difficulty watching a victim while swimming to assist them and the fact that flotation is lost when the unit is removed.

Front BCs are versatile for rescue situations—they are handy to snatch up quickly in an emergency and can be used in numerous ways. However, their bulkiness hinders resuscitation and they interfere with the removal of excess equipment.

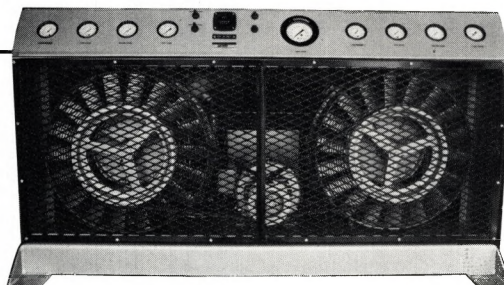
The Final Decision

Whatever you select, become intimately familiar with it before diving. And before you buy, try it in the water, make sure it is comfortable and the controls are easily accessible. Discuss your needs with other divers. Ask what they like and dislike about the units they use. Note that, usually, the flotation device in widespread use in a region is probably best suited for diving in that area. Spend a little extra for a low pressure inflator—it's worth it. Remember that selecting the right BC initially will ultimately save you money, and could also save your life.



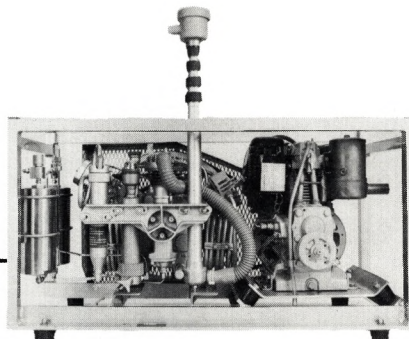
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WORKING DIVER

Two Floridians discover the hazards of diving by braille with the muddy underwater detail—the Rochester Police Department's

Mud Squad

BY JIM FLEMING
PHOTOGRAPHY BY
BOB WALLACE

"You can't imagine what a nightmare that dive was," said Police Lieutenant Warren Dyer. He then recounted an experience so terrifying I find it almost impossible to repeat without feeling a little unnerved.

On a slate gray, sub-zero day, a chain of events occurred in Rochester, New York that riveted the city's attention on Warren Dyer's group of police officers—the Rochester Scuba Squad.

In the cloud-filtered haze of dawn on January 10, 1976, a car carrying two young women to work was about to cross the 200-foot Genesee River gorge. During the night a fierce wind had sheeted the bridge with ice from the billowing spray of the Genesee's upper falls. When the car hit the slick surface of the bridge it careened out of control, jumped the curb and snapped the cold-brittled guard rail. The car landed upside down in a power company spillway 30 feet below the bridge. Still alive, the women screamed in horror as they were slowly swept over the brink and down into the raging torrent to their deaths.

"The car came to rest in 100 feet of water at the base of those falls. And brother, that's no-man's land." Even in the bright summer sunshine it looked like a forbidding place for any diver. Especially two Caribbean divers like photographer Bob Wallace and myself.

"On that falls accident, did you ever retrieve the, ah---" I couldn't quite get it out, sitting there in a borrowed wet suit on a small boat in the middle of a dark and forbidding river.

"Yeah, we got the power company to close the floodgates for 20 minutes. That brought the water level in the lower gorge down to where we could fetch one victim from a previously submerged treetop. But

Author Jim Fleming and photographer Bob Wallace are well known for diving in strange places. Both are regular contributors to Sport Diver.



The rolling dive locker of the Rochester Rescue Squad (left) is a converted bookmobile. It carries all the equipment needed to perform rescues and to recover any type or size of object, from autos to disassembled handguns (above).

the one inside the car, that was a piece of work at the bottom of that hellhole."

Lieutenant Dyer's description of the bottom of the Genesee did nothing to quiet my fears.

"It's a garbage dump," he explained. "Old cars, refrigerators, mattresses and all sorts of twisted, jagged metal and broken glass. Add to that the railroad cars from repeated derailments on the nearby trestle, swirling whirlpools, powerful currents and the rough, water-carved shale and you've got an impossible situation. Especially when you consider the visibility and wintertime temperature are both zip."

Fortunately for Bob and I, we would be diving several hundred yards down river from the falls, under near "ideal" Genesee River conditions: air-82 degrees, water-52 degrees, depth-34 feet, and visibility zero, as usual.

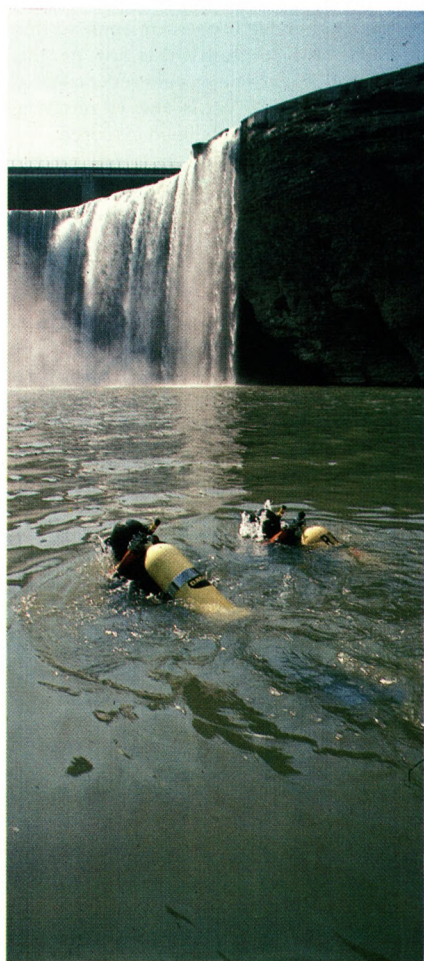
As we sat on the transom awaiting instructions, I noticed that an awful lot was missing. None of us had snorkels or buoyancy compensators, and when I reached around for my pressure gauge, instead of reading my air, I grabbed air. "All that

fancy stuff would get hung up on debris," laughed Sergeant Jim Bonell. "Besides, you'd never be able to read a pressure gauge in that muck."

Looking over at Bob, I noticed that something besides his enthusiasm was noticeably absent—his usual sci-fi array of underwater camera equipment. He looked positively naked without it. What good would cameras or strobes do in that black water? You couldn't even see a strobe if you flashed it in your face.

With an authoritative "Let's go!" from Lieutenant Dyer, we entered the water. Bob and I were the only ones who gasped as the cold water penetrated our wet suits. Without even five seconds to catch our breath, we were ordered to buddy up and descend. Watching the faceplate of my mask turn from dark brown to black made me feel a bit claustrophobic, but one thing I didn't feel was alone. I had a firm grip on my buddy's arm. That wasn't just a safety precaution, it was a vital part of our mission — a search for a handgun at the bottom of the river.

How do you find something that small in total darkness? By covering every square



inch of bottom by feel! The Mud Squad Search pattern was perfected by Armand Rahn, the retired founder of the group, during his service with the Navy's Underwater Demolition Team.

Here's how it works: Two inner tubes are placed on the surface secured by mushroom anchors. The tubes, the anchor lines and the anchors are spread apart by the length of a 50-foot line that runs along the bottom from anchor to anchor. Two divers enter the water and swim to one of the inner tubes. They buddy up, one diver with his right hand on the anchor line and the other with his left hand firmly clutching his partner's right wrist. In constant physical contact, they descend along the anchor line. The lead diver grasps the bottom line and the search pattern begins.

Heading toward the second anchor, the divers keep their chests close to the bottom, fanning their arms out in front of them and to the side in a constantly overlapping semi-circle. When the divers reach the second anchor, the lead diver moves it a full arm span in the prearranged direction of the search pattern.

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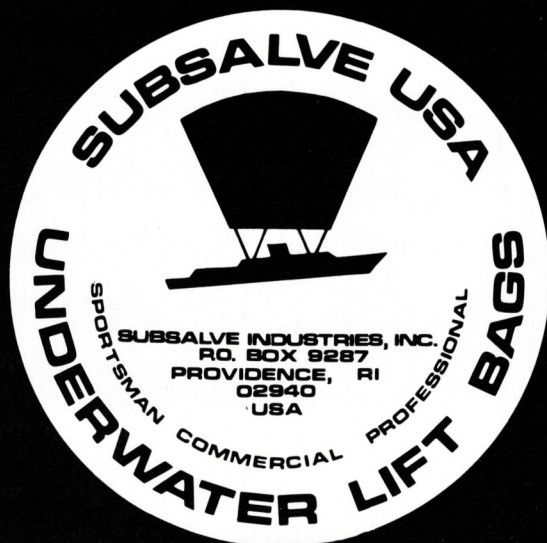
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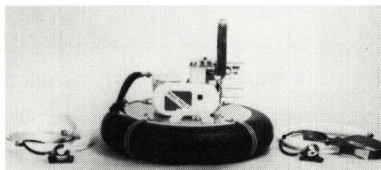
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WORKING DIVER *continued*

Now the bottom line is on a diagonal to its original plane and the divers reverse their direction. When they return to the first anchor, they move it one arm span so that the plane of the bottom line is now parallel to the original and the pattern repeats itself. In this way, one diver is always retracing ground that has already been explored.

This laborious system is one reason for the incredibly high recovery rate.

Although the depth of the water was less than 40 feet, on the way down it seemed more like 200.

At last, the bottom. We knew it was the bottom due to a change in the surrounding density from wet mud to damp mud. The bottom was pure mush, and for the first time since we began our descent, I was glad I couldn't see. I was also glad I was wearing heavy gloves, because Lieutenant Dyer was right: the place was a garbage dump. Amazingly, Jim Bonell didn't have any gloves on. "We can't use 'em," he'd explained earlier. "We rely completely on our sense of touch." That simple statement made me understand why Warren Dyer had told us before the dive, "A blind man could do this job and probably do it better than any one of us."

Bonell and I moved laterally toward the anchor at the other end of the bottom line. Somewhere along our first pass I thought I felt a shopping cart. On the second pass I was sure of it. In fact, the shopping cart was full of groceries.

And so, after a cold, miserable 15 minutes on the worst dive of my life, we headed for the surface. Black, black, black, dark brown, light brown, light brown, lighter brown—white and blinding—we reached the surface.

It took my eyes a while to adjust to the bright summer sunshine, but when they did, I saw Bob Wallace grinning at me through his brindled beard. His team had found the handgun, and all I had to show for my effort was an ancient can of tuna fish. "Chicken of the Sea?" Bob laughed. "Not quite," I replied. "Just mildly afraid of the Genesee River."

Several hours later we met Rochester Police Chief Thomas Hastings who had some thoughts about the humanitarian service the scuba squad performs.

"These officers have saved Rochester's citizens a lot of emotional pain. In the old days, before the squad's inception, we would drag for suicide and drowning victims with grappling hooks. You can imagine what a horrifying scene the retrieval was, especially for the victim's relations."

Today, the Chief explained, Dyer's men bring the important elements of humanity and compassion to the scene of a drowning. Not only do they make every effort to shield the retrieval process from view, they counsel the victim's family and friends before and after the dive. "We've received hundreds of letters commending them for brav-

ery, professionalism and for the peace of mind they give the victim's loved ones. That's the most rewarding part of this messy business."

Lieutenant Dyer added, "No matter how difficult the diving conditions are, you just can't say no to the mother of a nine-year-old drowning victim when she begs you to find her son."

Another important function of the squad is a highly specialized and vital part of police work—retrieval of evidence in criminal cases. In this field, the Mud Squad's rate of success is nothing short of phenomenal. "Consider this fact," Chief Hastings said, pointing to a map of Rochester. "Every escape route out of this city crosses a body of water." He described a circle bounded generally by Lake Ontario to the north, the barge canal to the south and various streams, rivers and bays to the east and west.

"These waterways usually provide a criminal with his first opportunity to dispose of weapons or other evidence as he flees the city." To a crook, those cold, dark waters must look like a permanent hiding place. And they probably would be if it weren't for Warren Dyer's troops. In the past 16 years the scuba squad has retrieved thousands of pieces of evidence. Everything from knives to disassembled guns to empty and loaded safes to stolen cars and yes, the bodies of murder victims.

"You could never order a man to do what the squad members do; they're all volunteers," Chief Hastings said. "And every one of those guys is a line officer, just like all the other policemen in the department. When they're not on underwater assignment, they drive squad cars, ride desks and walk beats. When we need them, day or night, they come running—that's dedication."

Like every other police chief, Tom Hastings is faced with budget constraints. When Armand Rahn first started the squad, they had to buy their own equipment and change in the back seats of their squad cars. Even today, they hardly have enough money to keep them in wet suits (a high-turnover commodity under these diving conditions.) Somehow, they scrounge what they need and get the job done.

Take the "scuba van" for instance. Back in the 1950's this old wreck was a bookmobile. Dyer saw it in the city derelict pound one day, and the rest is history. They commandeered it, and with six weeks of hard work and their own money the squad converted the ancient beast into a first class, rolling dive headquarters, complete with diving lockers, communications equipment, rescue paraphernalia and a color TV for entertainment during surface intervals.

"All the comforts of home," Chief Hastings boasted. After our experience, Bob and I know all too well that, on the way to a typical dive site, those comforts would be all too fleeting.

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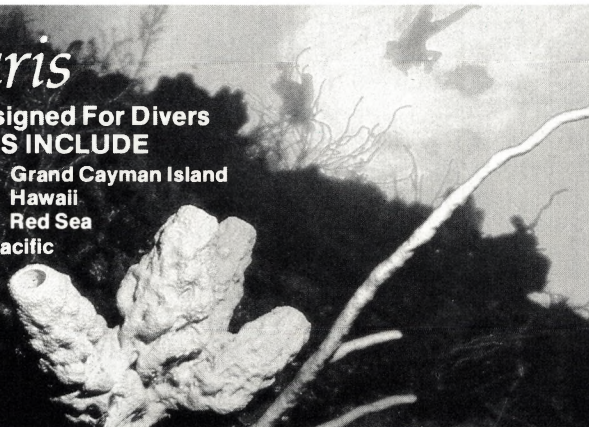
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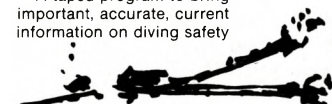
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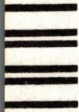
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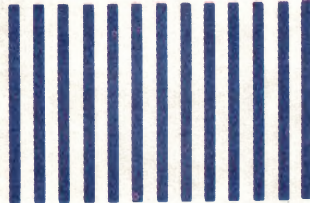
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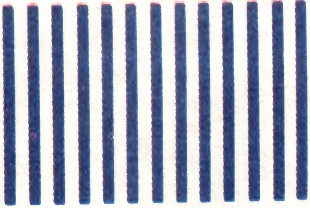
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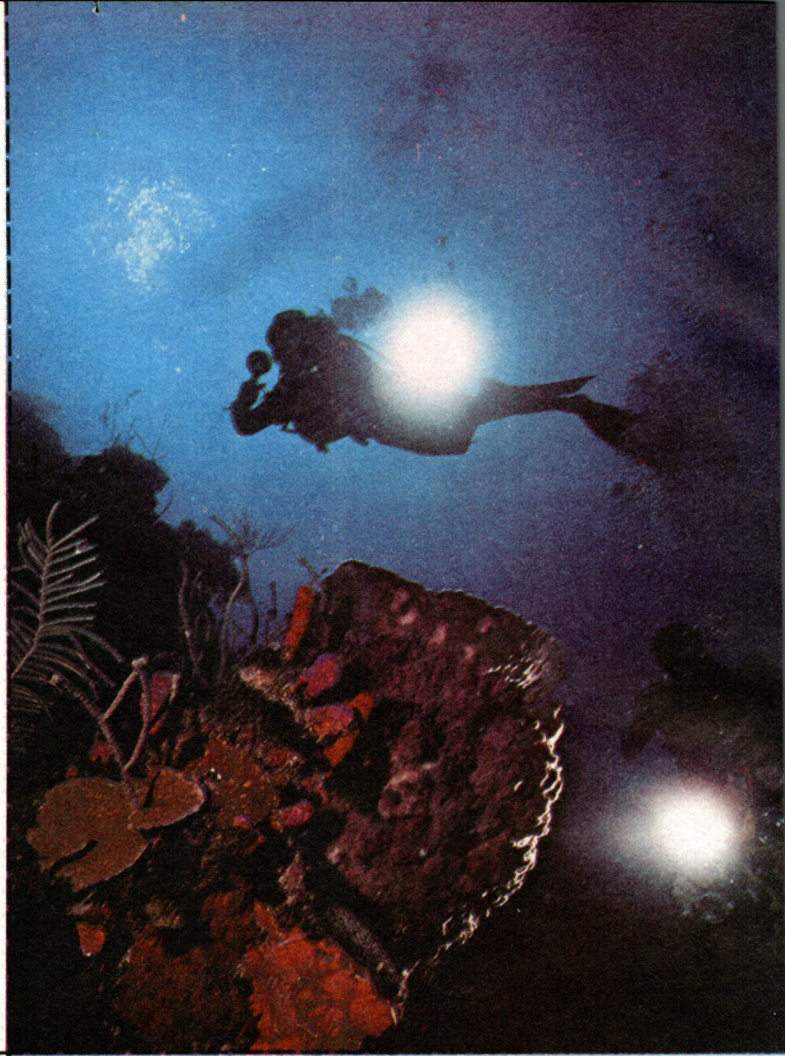
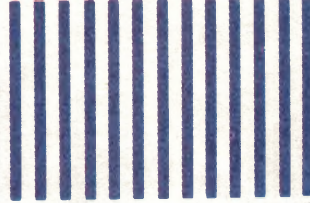
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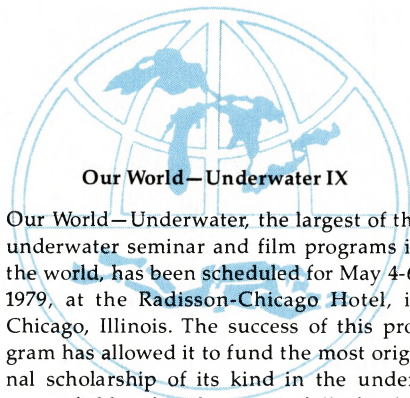
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FOR YOUR INFORMATION

Submarine School

Jules Verne would have loved it. Beginning January 15, 1979, courses in operating small submersibles will be offered in Key Largo, Florida by Kris Baringer. During the two-day course, students will learn the intricacies of guiding a small sub in open water. Utilizing a modified Kittredge K-250 sub which he built himself, Kris offers both basic operator and advanced courses. As the oil companies and scientific organizations rush toward the use of small subs for data collection and inspection duties, being a sub pilot could make you valuable. At \$200 a throw, the course will net you a gaggle of fun and an operator's certificate. For information, contact Kris at Neptune's Hideaway in Key Largo, Florida.



Our World—Underwater IX

Our World—Underwater, the largest of the underwater seminar and film programs in the world, has been scheduled for May 4-6, 1979, at the Radisson-Chicago Hotel, in Chicago, Illinois. The success of this program has allowed it to fund the most original scholarship of its kind in the underwater fields of endeavor. A fully-funded \$5,000 scholarship is awarded to an outstanding person between 18 and 26 years of age. This unique weekend offers more than 46 hours of viewing and information by over two dozen experts.

There will be exhibits (over 40 booths), workshops, and presentations. And, as in the past, an outstanding Saturday evening film festival will be held in the Medinah Temple. For information on tickets, write Our World—Underwater IX, Tickets, P.O. Box 4428, Chicago, IL 60680.

First Solas Certificate

The Impossible Dream was granted the first Solas (Safety Of Life At Sea) certificate ever given a wooden vessel, reports owner Dan Wagner of Seaventures International, Inc. Due to the strength and safety features built in, she has also been given the very first 30-mile Solas ever granted by the U.S. Coast Guard. The Impossible Dream may carry passengers from West Palm Beach, straight to Grand Bahama or Bimini, and throughout the Bahama Islands.

RESORT UPDATES

Eustatia Island

Undecided on your vacation plans this year? A cozy mountain atmosphere sounds so relaxing, but you're captivated with diving from an island's sandy beach. Now, you can have both!

Opened in December by Bob Price, Mountaintop is a small, diver-oriented guest house uniquely located on Eustatia Island, in the British Virgin Islands.

Diving vacations are being offered in collaboration with Jaki and Bert Kilbride, of Kilbride's Underwater Tours. There are three private beaches on the island, with sailing also available.

On exhibit in the house will be underwater artifacts gathered by Bert Kilbride during his years on the island. For more information, contact Bob Price, One Pine Rd., Beverly, MA. 01915. Tel. (617) 922-1289.

Crooked Island

Pittstown Point Landings, Ltd., formerly Marina Inn on the northwest tip of Crooked Island, Bahamas, has just reopened for business. For information on diving services contact T & M Associates, Inc., 1640 SE 7th St., Fort Lauderdale, FL 33316.

San Salvador

Dave Woodward has accepted the position as President of Island Divers Limited, the diving arm of the Riding Rock Inn, on San Salvador, Bahamas. Now in the process of setting up programs for their new Scuba Workshop building and photolab, he will soon announce an expanded instructional program in underwater photography, including daily processing of E6 Ektachrome films. One- and two-day in-

troductory courses and photo coaching are planned.

In addition to these underwater photo programs, they will be placing special emphasis on Learn to Dive in the Sea certification courses. For information or to make reservations, call the Columbus Landings Travel Desk in Fort Lauderdale, Toll-free at 800-327-9473 or in Florida, 305-566-7441.

Palm Beaches

Captains Dee and Frank of Frank's Dive Shop, Riviera Beach, Florida, have announced the christening of their new boat will take place on March 15, 1979. The vessel is a custom-built, 48-footer, and is Coast Guard approved for 38 people. She will carry fresh water, six V-bunks for napping between dives, plus stand up head and galley. For reservations call (305) 848-7632.

The Red Sea

With the appointment of Oren N. Most as the U.S. Representative of Red Sea Divers, begins the "1979 Red Sea Year" campaign in the U.S. The campaign will kick-off with an exhibit at DEMA in January, in New Orleans. A new movie about the Red Sea will be premiered by Jack McKenney, and David Doubilet will present a series of slides taken in the Red Sea for *National Geographic Magazine*.

Reduced air fare to Israel, new direct flights, and reasonable prices for diving and accommodations should now make the Red Sea much more attractive. For a colorful information packet, contact Red Sea Divers, U.S. Representative Oren N. Most, 9200 Sunset Boulevard, Penthouse 9, Los Angeles, CA 90069. Tel. (213) 930-0137.



Bahamas

If you enjoy unusual travel make your next trip to the Bahamas on a seaplane. Chalk's Airlines offers the only commercial seaplane service, and the oldest continuous airline service to the Bahamas. Departing from dockside on Watson Island, Miami, Florida, Chalk's seaplanes serve Bimini, Cat Cay, and Paradise Island direct. The seaplanes are not required to set down at the sometimes out-of-the-way airports, but can deliver you directly to any dock with customs facilities. For information and reservations, write Chalk's International Airlines, Watson Island, MacArthur Causeway, Miami, FL 33132. Tel. (305) 337-8801.



Attention Diving Dentists

The Diving Dentists Society, Inc. is a newly formed organization, founded in 1977 for the purpose of studying those aspects of diving in which dentists have a special interest, such as mouthpiece shape, size and fit. Dr. Mark Curl was elected president at the Second Annual Meeting, which took place in Key Largo, Florida.

The 1979 Annual Meeting is expected to be located at a suitable diving site and feature speakers interested in dentistry and diving. Membership is available to those associated with dentistry as a professional or auxiliary. For further information, write Don N. Brotman, D.D.S., Horizon House, Calvert at Chase Street, Baltimore, MD 21202.

New Park for Monk-Seals

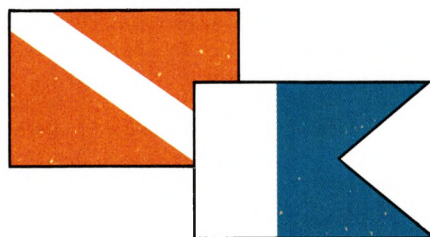
An area of Sardinia (an island, west of Italy) has been designated a "National trust property for the last monk-seals in the Mediterranean." The park, located on the coast near the small village of Banuei Nuoro, provides a "private coast for this sea-animal."

Mayor Pasquale Zaccas initiated the program after his research (including exploring sea caves), indicated only six or seven monk-seals still live along the coastline. He found too, that excessive noise, such as motor boats, promotes premature birth, which impedes their population growth. With this in mind, the new park was situated in one of the few areas in Italy, where there are no hotels or tourist concessions.

U.S. Distribution for AMF Mares

AMF Mares, one of Europe's largest diving equipment manufacturers, announces that the Mares line of diving equipment will be distributed by SeaQuest, Inc. under the name "Mares USA" in all 50 states, and "Mares Canada" in all Canadian provinces.

SeaQuest is presently headed by Charles Jehle, President, and Chuck Jehle, Vice President with headquarters at 722 Genevieve Street, Suite M, Solana Beach, CA. Jim Cartwright of Fitz-Wright Manufacturing will head Mares Canada, with their home office located at 17919 Roan Place, Surrey, British Columbia V3S 5K1.



New Dive Flag or No?

According to the U.S. Coast Guard's Boating Safety Department in Washington, D.C., the rumor that the United States has adopted the international diving flag to replace the traditional red-and-white divers down flag is just that—a rumor.

Spokesman Roma Wade said that recently, at an international conference, the U.S. agreed to recognize the blue-and-white pennant when flown by foreign vessels in U.S. waters, but that the flag in no way supersedes or replaces the traditional flag for vessels of U.S. registry.

Rumors that the Coast Guard adopted the international signal has some divers worried they would have to fly both flags to comply with U.S. and state regulations.

4,000 For Looe Key

The Marine Wilderness Society has just forwarded to U.S. Congressman Dante B. Fascell (D, Fla.), petitions with 4,000 signatures favoring immediate designation of Looe Key Reef as a federal marine sanctuary. This is the latest in a series of moves by the Marine Wilderness Society intended to overcome a request by the Federal South Atlantic Fishery Management Council, to delay sanctuary designation of Looe Key Reef, in the lower Florida Keys.

Looe Key is part of the only living reef in North America: the Florida Reef. Stretching from Key West northward, the chain of coral has been severely damaged by neglect and misuse. During World War II, Looe Key was used for target practice by U.S. Air Force bombers. More recently, commercial fishermen have begun setting fish traps around Looe Key and other sections of the reef. Marine sanctuary status would bar this and other forms of abuse.

The Marine Wilderness Society's petition reads: "Looe Key Reef's unique coral formations and marine life, need protection now! Cancel NOAA's 18-month delay order. Push ahead Looe Key Reef's designation as a marine sanctuary. Save Looe Key Reef now so we can all still enjoy its wonders tomorrow!"

Advocates of the Looe Key Marine Sanctuary maintain that a delay for more study is unwarranted, pointing to a thorough "Looe Key Biological Inventory", completed by NOAA as part of the reef's sanctuary designation process. The Marine Wilderness Society has taken the position that the two-year delay request, if upheld, could result in the indefinite or permanent loss of sanctuary protection for Looe Key Reef. For more information, write The Marine Wilderness Society, P.O. Box 943, Miami, FL 33165.



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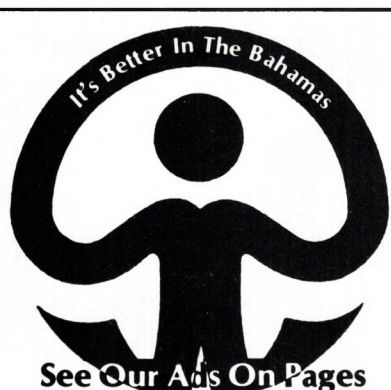


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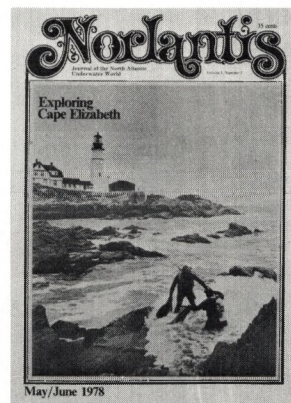


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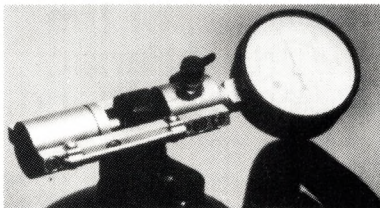
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FOR YOUR INFORMATION *continued*

Sea '79

Saturday, May 12, is the date for the Fifteenth Annual International Underwater Film Festival at the Paramount Theatre of the Arts, Oakland, California. Sponsored by the Northern California Chapter of the Underwater Photographic Society, this is the oldest underwater film festival in the U.S., and draws exhibitors and entries from all over the world.

A major attraction at the festival is the international competition. Both amateur and professional photographers are encouraged to enter. Deadline for entry is

April 20, 1979. The UPS Film Festival has always led the field in new and innovative underwater photography with many major underwater movies making their debut.

Paul Tzimoulis, publisher of *Skin Diver Magazine*, will be the Master of Ceremonies for what is guaranteed to be an exciting evening of entertainment. For further information on the film festival and entry blanks for the competition, write the Underwater Photographic Society, c/o Rich Bergero, 22430 Thunderbird Place, Hayward, CA 94545.

A New Trade Journal

Dive Industry News is a new trade publication of the PADI Training Facility program and caters to the interests of retailers in the sport diving industry. Published quarterly, it is mailed without charge to all dive-oriented businesses on a national level, and by subscription on an international level.

Serving as a regular means of communication within the business world of sport diving, readers are provided with a wide range of coverage.

Interested retailers should contact *Dive Industry News* Publisher, Paul Hill, or Training Facility Director, Al Hornsby, at PADI Headquarters, 2064 North Bush Street, Santa Ana, CA 92706. Subscriptions at \$5.00 a year are available to instructors and those not in U.S. zip code areas.

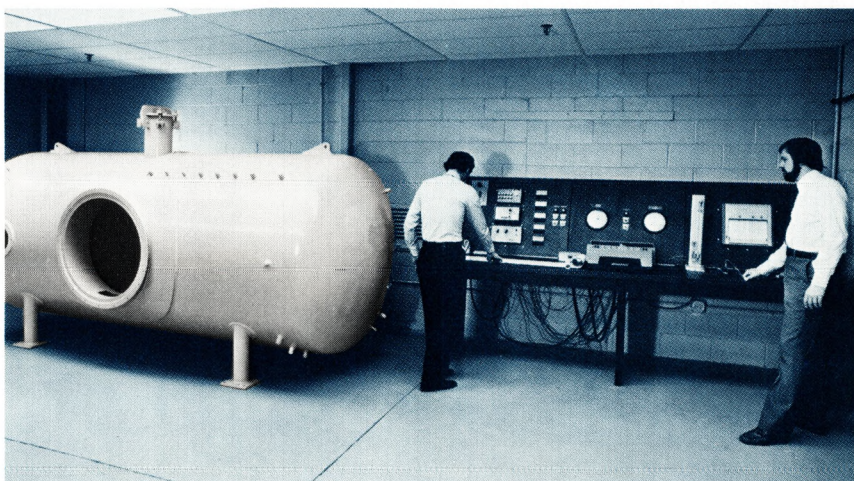


Dacor Installs Chamber For Regulator Testing

Dacor Corporation, manufacturers of diving equipment, has announced the installation of a wet hyperbaric chamber in the company's new factory addition. The chamber will be used for testing regulator performance under actual conditions.

The pressure vessel was used a few years ago as the habitat for divers taking documentary photographs of the exploration of the sunken Italian luxury liner, "Andrea Doria."

Rebuilt to Dacor's specifications, this new testing facility can accurately measure regulator performance at depths ranging from zero to 300 feet. The system can simulate a submerged diver's breathing requirements at different depths, as well as continually monitor and record all data. The new facility will conduct routine testing of production samples, and aid in the research and development of new and safer regulators.





SEACOR

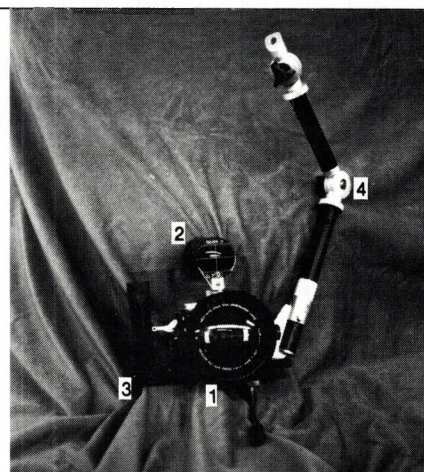
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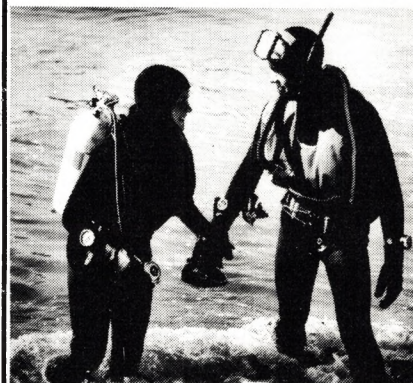
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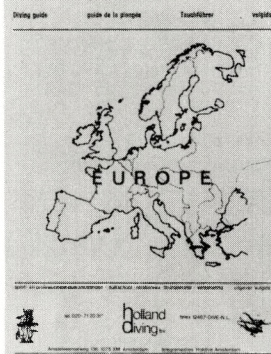
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REVIEWS

DIVERS GUIDE 1978



Diver's Guide
Holland
Diving Ltd.;
Holland
Diving Ltd.;
softbound

This is a guide to the air filling stations of Europe. There are some descriptions of the diving available in each country covered, addresses of recompression chambers are noted and laws pertaining to diving are listed. Areas covered are: Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Faeroes Islands, Federal Republic of Germany, Finland, France, German Democratic Republic, Great Britain, Greece, Guernsey, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Switzerland, Spain, Sweden, Turkey, Yersey, Yugoslavia. The book is available from Holland Diving Ltd., 136 Amstelveenseweg, 1075 XM Amsterdam, the Netherlands.



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Papers from the First Southern Hemisphere Conference on Maritime Archaeology;
Ocean's Society of Australia; 1978; Softbound; 160 pages; \$9.90 Australian.

Often divers in the U.S. forget there is a larger world around us; one filled with divers whose experience exceed ours.

With the current debate over the roles of treasure hunters, individuals and governments in the recovery of historic shipwrecks it is valuable to investigate how other nations have approached the problem.

In conjunction with the CMAS Fifth World Underwater Congress held in Australia last year, a symposium on maritime archaeology was organized.

The participants were from various countries including: Jeremy Green, Australia; Robert Stennuit, Belgium; Robert Marx, U.S.A.; Gerrit van der Heide, Netherlands, and Kelly Tarlton, New Zealand.

The proceedings detail both the academic papers describing shipwrecks worked in the various countries and discussions on laws, regulations and techniques.

The book is available only from the Ocean's Society of Australia, P.O. Box 4604, GPO Spencer Street, Melbourne, Victoria, 3001 Australia.

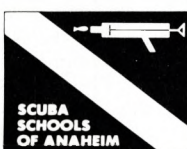
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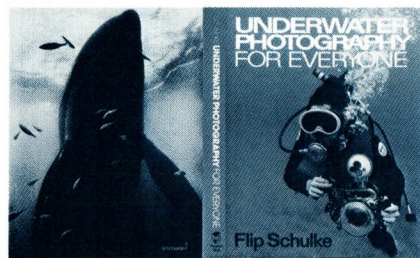
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Scuba Schools of Long Beach 213-433-6765
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129 So. Hill, Oceanside, Ca. 92054

Underwater Photography for Everyone;

Flip Schulke; Prentice-Hall;
Hardbound; 213 pages;
\$14.95.

Flip Schulke has been a part of underwater photography since the medium first became practical 25 years ago. In that time his photographs have appeared in *National Geographic*, *Newsweek*, *Time*, *Life*, *American Cinematographer*, *Skin Diver* and *Encyclopedia Britannica*. His experiences have been as diverse as this collection of periodicals suggest; from photographing a killer whale in its tank to shooting an entire line of high-fashion clothing underwater (for the London *Daily Telegraph*).

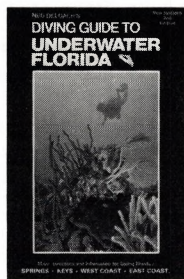
Schulke's book is a distillation of his experience, providing both technical help for beginner or advanced amateur, and anecdotes that reveal the human side of the business of underwater photography.



Schulke's explanations are straightforward, complete and fully explicated with beautiful exemplary photographs and diagrams. The text moves smoothly from equipment selection through special techniques, leading the reader on a step-by-step discovery.

Diving Guide to Underwater Florida;

Ned DeLoach;
New World
Publications; 1978;
Softbound.

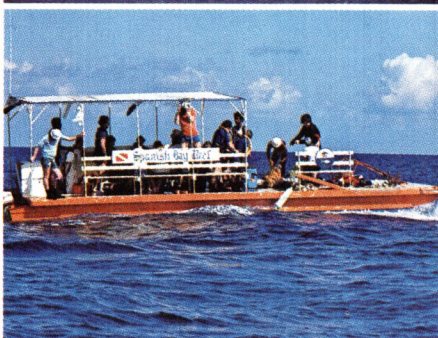


This is the second edition of the most popular diving guide to Florida. It contains updated information, maps, concise directions and complete descriptions to dive sites throughout the Florida peninsula and the Keys.

This new edition has 52 more pages than its predecessor and more photographs to describe the sites.

To the thousands of divers who visit the Keys each year, the Guide can help locate favored spots—but more importantly—it can reveal the numerous north and central Florida sites that are often passed by.

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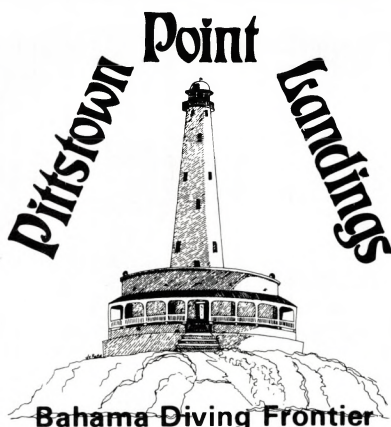
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February

9-12 Tomorrow's Ocean III

Jean-Michel Cousteau will be the guest speaker at the third of the series of "Tomorrow's Ocean" symposiums, hosted by Aqua Reisen International and the Society of Lauderdale Divers. The session's theme will be "The Diver's Environment", and it will be held in Fort Lauderdale, Florida. For further information contact Margaret Witts, Aqua Reisen International 20, S.E. 8th St., Fort Lauderdale, FL 33316, (305) 467-2822.

16-18 U/W Expo '79

Everything to see and learn about the sea will be on display in the West Palm Beach Auditorium, in West Palm Beach, Florida. The show will feature artifacts, salt water aquariums, shell collections, shellcraft, scuba gear, diving resorts, jewelry, and other marine-related exhibits. Also included are underwater films and slide presentations. Information about the show may be obtained from show chairman Dr. Marvin Glickstein, P.O. Box 14554, North Palm Beach, FL 33408, (305) 833-8604.

23-25 11th FSDA Film Festival

The Florida Skin Divers Association 1979 film festival will be hosted by the Clearwater Sea Salts, and held at the Plantation Inn, at Crystal River, Florida. Scheduled events include a get acquainted party, a mini-film festival, photo contests, and diving. For additional information contact Jack Griessel, 1709 Oxford St. North, St. Petersburg, FL 33710, (813) 347-9935.

March

10 Sea Rovers '79

The Boston Sea Rovers 25th Annual Underwater Clinic will be held at Boston University and John Hancock Hall. For information contact Bunky Hodge, 174 Beech St., Rockland, MA 02370, (617) 878-8710.

17 & 18 Man In The Sea Symposium

One of the year's most important North-western diving events will take place at the Pacific Science Center in Seattle, Washington. For more information concerning programs, tickets, and the Inter-

national Photo Competition, write George Axtell, 13638 Southeast 37th, Bellevue, WA 98006, (206) 641-7168.

17 & 18 Man & The Sea Conference-III
Supported by Temple University—Oceanic Society, Philadelphia Maritime Marine. Contact: Dr. Robert Leahy, Underwater Education and Research, Temple University, Philadelphia, PA 19122, (212) 787-8720.

30-4/1 U/W Canada '79

The Ontario Underwater Council is once again sponsoring this annual international underwater film show and symposium. The convention will be held in the Convention Centre of the Skyline Hotel in Toronto, Ontario. This program has become a focal point for sport divers and non-divers alike, providing an entertaining and educational weekend of films, lectures and commercial displays. For further information write Ontario Underwater Council, 559 Jarvis Street, Toronto, Ontario M4Y 2J1.

31-4/7 Advanced Course On The Medicine And Physiology Of Sport Diving.

Sponsored by the Undersea Medical Society and held at Grand Cayman, British West Indies, the course will emphasize clinical aspects of recent developments in diving medicine. An unusual opportunity for diving physicians to spend a week diving and studying with recognized leaders in the medical profession. Interested physicians contact Medical Seminars, Inc., P.O. Box 530441, Miami Shores, FL 33153, (305) 751-7660.

April

20-22 NAUI Canada

The Second Annual NAUI Canada Underwater Conference Subaquatique will be held at the Chateau Granville and the Vancouver Aquatic Centre in Vancouver, B.C. There will be U/W photo instructional seminars, equipment evaluation sessions, and an opportunity to learn how to operate a one-man submersible. Tours of the Vancouver Aquarium and the Hyperbaric Treatment Centre are also scheduled. For more details, contact NAUI, Box 510, Etobicoke, ONT M9C 4V5.

21-28 The 12th International Advanced Physicians Underwater Medicine Program.

The Riding Rock Inn, in conjunction with Island Divers Limited located on San Salvador, Bahamas, will host this week-long academic program. Selected topics of the program focus on cardiovascular physiology, and an in depth review of the theory underlying decompression tables as well as medical problems in mixed gas diving. In addition, a complete diving program arranged by Lee Turcotte's Atlantis Safaris. Contact PUMP, P.O. Box 530344, Miami, FL 33153, (305) 754-7480.

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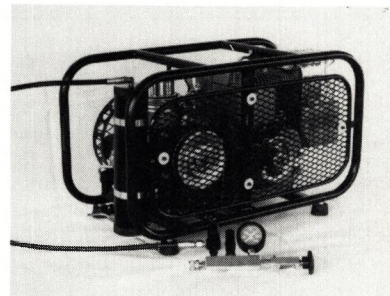
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I Learned About Diving From That

We had no plan and—almost—no hope.

BY DEE MOSTELLER

There was one day in my development as a diver—I remember it vividly—when I learned practically everything I know about diving.

I think my background in diving would help set the scene, although none of this should be taken as an attempt to place the blame on a shop or instructor. Due to my own schedule, my basic course was spread out over three months. Twelve full weeks elapsed from the first of four lecture-pool sessions to the second open-water dive. Meanwhile my instructor had a disagreement with the shop owner and had lost all interest in the course. He wasn't even around when I took the final check-out dive.

During the open water dives I was never required to orally inflate my BC. We used back BCs with direct inflators which were always hooked up by the instructor. I was never asked to clear my mask in salt water and I'd never even done this successfully in the pool, although no one had noticed. I hadn't done an emergency ascent; checked a depth gauge; figured air consumption or elapsed bottom time; had to compensate for swimming in a current or help a buddy in distress.

But I had a C-card so I could legally go out and rent equipment and take a dive. I did this, in the Virgin Islands, with one of my scuba classmates and his son. The son had taken a basic course five years before and hadn't dived since.

From the moment we left the beach without checking the condition of the water to the end, when we left our equipment unwashed, we did everything wrong.

One major problem was our lack of experience with the equipment. The son had never worn any type of BC, my buddy and I had worn only back-mounted BCs. When we were given front BCs with crotch straps, it only confused us. None of us knew how much weight to wear, and consequently, we all were overweighted. Also, the inflators on the regulators and the BCs we rented would not mate. An honest mistake by the shop, but one that could have cost a life—and almost did.

We spent 20 minutes suffering in the heat—on the beach of course instead of in the cool water—trying to match these unmateable connectors before giving up. Next we had another straining session trying to adjust the uncomfortable crotch straps. One of my bud-

dies fiddled with mine and it was suddenly much more comfortable. I didn't check to see what I had sacrificed for the comfort.

Geared up and perspiring, we decided to go down close to shore and check out some shallow reefs that were already familiar to us—a wise plan had we stuck to it. As soon as we became relaxed in the water, however, we all turned and headed for the wall.

We didn't notice the strong ebb current, and we reached deep water very quickly. We never knew how deep because none of us had a depth gauge.

Shortly my main buddy showed me his pressure gauge, which was registering in the blue at the low end of the scale. The son and I gave him the what-a-creep look as we each had about 1000 psi left.

He indicated he would go back alone so his buddies could continue having fun. The son and I signalled "okay" and up he went.

Thinking we were still fairly close to shore we headed out to sea, swimming rapidly. Of course it was not long before both of our gauges were nearing the blue. With what I now recognize as the approach to panic—a wide-eyed stare—my buddy pointed behind us. We turned and started to swim in what we believed to be the direction of shore. We were guessing of course because we didn't have a compass. For the first time we became aware of the outgoing current as our progress toward shallow water, shore and home was dangerously slow.

I felt a prickling in my thumbs and I had an irrational urge to surface. Trying to act calm for the benefit of my younger buddy, I swam gallantly on—on the bottom. Soon he punched me on the arm and shoved his gauge in my face. It read zero!

Ignoring him and his problems, I headed for the surface at top speed. I shot out of the water like a tiny torpedo, plopped down into heavy swells and immediately started to sink. It was about then that I remembered what a lousy swimmer I am and noticed that the shore was an uncomfortable 300 yards away. I also realized that my buddy, the one with no air, wasn't up yet.

Hyperventilating and dizzy, I looked down for him. Naturally I had taken off my mask to breathe as soon as I broke surface, and the sting of salt water in my eyes added to my panic. I was calmed momentarily when my buddy popped up—until I remembered our third buddy—his father—and the fact we had left him go back alone.

The shoreline was empty. Nothing, no one in sight. I really came unglued then, the

whole process of elimination—his and mine—running through my mind. I began to fight everything, the waves, the BC, the regulator hanging at my side, the situation.

While I wallowed in this state, my buddy, also near panic, took one look at me flailing about, lost his own fear and gasped, "Are you all right?"

"No," I answered. Just then I started to sink again. I tried to inflate my BC orally but found I really didn't know how and was letting out as much air as I was putting in. I forgot all about the two CO₂ cartridges in the BC inflator, but did remember the weight belt (one out of two anyway). When I unhooked the belt, I discovered what my other buddy had done to make the crotch strap more comfortable—put it behind the weight belt! So the belt dangled behind me, just out of reach. When I realized the stupidity of it all, I started to laugh. That and my buddy inflating my BC probably saved my tail.

It also reminded me of the sonovabitch who had "fixed" my strap and who was by now probably no longer of this world. I turned toward shore just in time to see the "departed" one crawl out of the surf. He lay at the edge of the water so long I figured he must surely have drowned.

I finally managed to drop the weight belt and we started the long swim. My buddy occupied himself by watching me and saying "Let's rest a while. Take it easy. Are you okay?"

I was cheered considerably to see buddy number two moving around on the beach, disengaging himself from tank and harnesses. His weight belt, we found out later, was out there with mine. He had the same experience I had—couldn't inflate his BC, had tangled his weight belt in the crotch strap, and had gone through seven stages of panic before reaching shore. Only he'd done it alone. I wonder, had I been alone, if I would have made it.

When I crawled out of the water, I vowed to do one of two things—hang up my flippers or go back and get more education. Fortunately I chose the latter.

And it turned out to be much easier the second time around. After all, I had learned just about every basic lesson possible, from the importance of proper dive planning and equipment selection, to control of panic, to the importance of being aware at all times of depth, time, air consumption and environment—all in one 40-minute dive. Or was it 50 minutes? Or 30? Who knows. None of us had a watch.

Dee Mosteller is now an experienced diver and writer. Her work appears in many national magazines.

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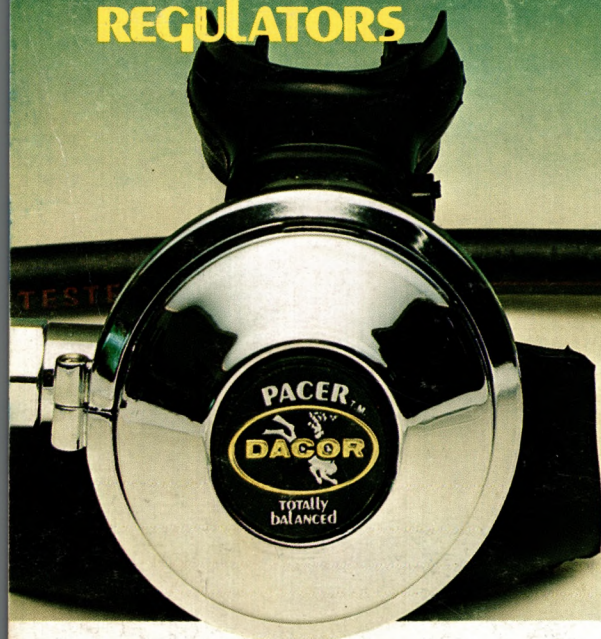


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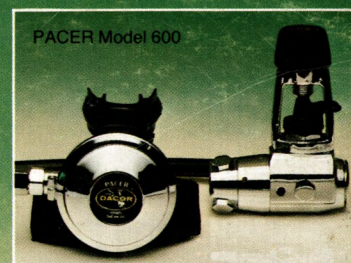
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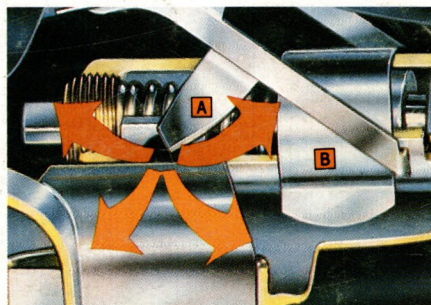
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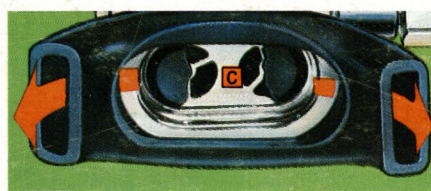
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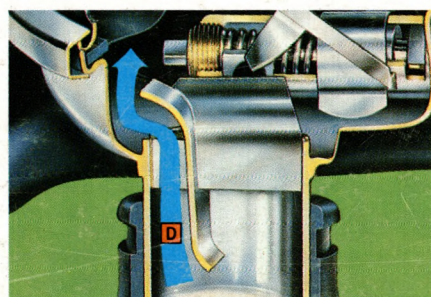
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